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ABSTRACT

The 1994 Study of Communications Technology in Higher Education was a nation-wide survey of colleges and universities about instructional uses of microcomputers and audiovisual and multimedia technologies. Eight questionnaires were developed: six for institutional-level spokespersons at 1,000 randomly selected institutions in the United States; one for 2,000 faculty in a random subset of 100 institutions; and one for 1,005 full- and part-time college and university students. The survey found pervasive use of computers in higher education. A sizable percentage of schools offered distance education programs but the percentage of faculty who taught these courses and overall student enrollment in distance education was low. Cable appeared to be used more than public television as the dominant telecourse medium. Slightly over half of faculty used video instructional materials in a class during the academic term, about a third used audio instructional materials, and about one seventh used multimedia materials. Almost all teacher education programs offered training in instructional uses of computers. Respondents had very positive views about the benefits derived from computers and other instructional technologies. Networking was seen as the area of least perceived accomplishments. Insufficient funds was the most significant barrier to increased use of technologies. The eight surveys are appended. (JLS)

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April 1995

1994 STUDY OF COMMUNICATIONS TECHNOLOGY IN HIGHER EDUCATION

Final Report

Prepared for:

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Executive Summary

1994 Study of Communications Technology In Higher Education

The 1994 Study of Communications Technology in Higher Education was a nation-wide survey of colleges and universities about instructional uses of microcomputers (PCs) and audio, video, and multimedia (AVM) technologies in both on-campus and distance education courses. The study results provide a wealth of information that can help educators, policy makers, and funders and producers of educational program-ming evaluate current uses of technology and develop plans for expanded and more effective uses. Individual colleges and universities also can use the results to better understand how their use of instructional technologies compares with that of other institutions.

The survey included:

- Up to six institutional-level spokespersons at each of 1,000 randomly selected colleges and universities in the United States.
- A total of 2,000 faculty in a random subset of 100 institutions.
- 1,005 full- and part-time college and university students, identified through a nationwide random sample survey of households.

Institutional-level spokespersons and faculty were surveyed by mail between April and September 1994. For the most part, they were asked to report on experiences during the 1993 Fall Term. The students, who were interviewed by telephone during the summer of 1994, reported on experiences during the most recent academic term completed during the past 6 months. The survey results can be generalized to all accredited, public and private, non-proprietary 2- and 4-year colleges and universities in the United States that provide general programs of instruction.

This overview report includes key findings regarding faculty and student use of computers and AVM technologies; the availability at institutions of various kinds of technology-based facilities, equipment, and services; support provided to faculty and students in the use of technologies; ways in which distance education courses are taught; and perceptions of technologies.

Access to and use of computers in higher education is pervasive.

Faculty and student use of computers is widespread and frequent, and essentially all faculty and students either own a computer or have access when they need it. Nine out of 10 full-time regular faculty members used a computer for research or instructional purposes at least once during the 1993 Fall Term, and half used one daily. Among students, more than 8 in 10 used a computer at least once during the past academic term, and about half used a computer to do school work more than once a week.

By far the most frequent use of software is for word processing. Large majorities of students (75 percent) and, especially, faculty (85 percent) used word processing software for school-related purposes during the past term (students) or the 1993 Fall Term (faculty). Next most commonly used are spreadsheets (used by 40 percent of faculty and 26 percent of students) and graphics packages (used by 33 percent of faculty and 22 percent of students). Among both faculty and students, those in doctoral institutions are the most likely - and those in public 2-year schools are the least likely - to be frequent users or owners.

PCs are important as communication devices.

The relatively new technology of computer networks has penetrated higher education quickly. More than 8 in 10 faculty reported that they have computer network services available to them, and over half use these services (60 percent used them in the past 30Êdays). Use of network services by students is somewhat lower but still substantial - 45 percent of students reported using these services during the past academic term. Nevertheless, only about 3 in 10 students have access to the Internet or Bitnet, compared with about 8 in 10 faculty.

The most widely used network service, especially by faculty, is e-mail; about half of the faculty used e-mail in the past 30 days, and about a third of the students used it during the past term. By type of school, the percentage of faculty who used network services in the past 30 days ranges from 38 percent of those in public 2-year schools to 77 percent of those at doctoral schools. Similarly, network use among students is highest in the doctoral universities and lowest in the public 2-year schools. About two-thirds of students in doctoral universities used some kind of network services during the past academic term, compared with half of those in comprehensive schools and only a fourth of those at public 2-year schools. These differences reflect, at least in part, differences in the availability of network services among the several types of schools.

Although a sizable percentage of schools offer distance education programs, the percentage of faculty who teach these courses and overall student enrollment in distance education are still very low.

About one-third of higher education institutions - mostly public institutions - offer for-credit distance education* courses, but only 7 percent of the faculty reported that they taught one or more for-credit higher education distance education courses during the 1993 Fall Term. Among students, only 3.5 percent of those surveyed reported that they were enrolled in a for-credit distance education course during the past term.

Video has overtaken print as the distance education medium of choice.

Print-based correspondence courses, now offered by only 7 percent of institutions, are becoming a thing of the past. They have been overtaken by a variety of technology-based (largely video) courses, which are offered by 25 percent of institutions. Still, among the schools that offer each kind of course, the average number of courses offered and the average estimated enrollment are much smaller for the technology-based courses (with 14 courses, 304 students) than for the correspondence courses (with 49 courses, 1,457 students).

There are clear differences between the kinds of distance education offered by 2-year and 4-year schools.

Two-year colleges tend to offer pre-recorded video courses distributed through cable and public television stations to nearby students, most often in their homes. In contrast, 4-year colleges and universities are likely to offer Ohigh-techO interactive courses distributed through cable or government delivery systems (for example, satellite, closed-circuit systems) to faraway students, most often at a location outside their home or workplace.

Cable has overtaken public television as the dominant system for distributing telecourses.

As of the 1993 Fall Term, 44 percent of institutions that offered video courses used cable systems to distribute them, compared with 35 percent who used public television stations. Other methods used by about a fifth or more of schools were state or regional government delivery systems, telephone company lines, instructional television fixed service, and campus closed-circuit systems.

Use of video materials in on-campus courses is fairly common, but use of audio and,

especially, multimedia materials is not.

Slightly over half of faculty used video instructional materials in a class during the academic term, about a third used audio instructional materials, and about one in seven used multimedia materials.* Contrary to the computer-use patterns, faculty in public 2-year schools are the most likely to have used these materials, whereas those in doctoral schools are the least likely to have done so. Almost half of the faculty have videotaped public television programs at some time in the past for use in a college course.

On-campus video courses are almost as common as video courses offered at a distance.

A fourth of colleges and universities offer on-campus courses in which the instruction was delivered primarily through videotape or live video feed. As with distance education, public institutions are more likely than their private counterparts to offer on-campus video courses. For example, 55 percent of the public doctoral universities offer these courses, compared with 32 percent of the private doctoral universities.

Almost all teacher education programs offer training in instructional uses of computers, but training is more common at the undergraduate than the graduate level.

In all types of institutions, over 90 percent of schools that have teacher education programs offer some kind of training in the instructional uses of computers to at least some of their teacher education students. Most types of training are more commonly required at the undergraduate than the graduate level. For example, 66 percent of schools require undergraduate teacher education majors to receive training in use of instructional software, but only 39 percent require this of teacher education graduate students. However, the percentages of schools that offer the various types of training as an elective to graduate students typically are about the same as the percentages that offer them to undergraduates.

Although students and faculty in education programs are about average in their use of computers, education faculty are more likely than other kinds of faculty to use AVM materials, including public television materials, in the classroom.

According to self-reports, students majoring in education and education faculty at 4-year schools are about average in the frequency with which they use computers. However, more than 8 in 10 education faculty reported using AVM materials in their for-credit courses during the 1993 Fall Term, whereas fewer than 7 in 10 non-education faculty did so. Two-thirds of education faculty, compared with about half of non-education faculty, reported that during the 1993 Fall Term they used video instructional materials in the classroom. Education faculty also are more likely than others to have videotaped public television programs. Forty percent of education faculty, compared with 24 percent of other 4-year school faculty, reported that during the preceding 12 months they had videotaped a public television program for use as an instructional tool in a higher education for-credit course.

Respondents have very positive views about the benefits that their institution has derived from computers and other instructional technologies.

With only small differences among the various types of institutions, more than 9 in 10 respondents to the Chief Academic Officer questionnaire and 8 in 10 faculty feel that the quality of education at their institution has benefited a moderate amount or a great deal from computers and other instructional technologies. Eight in 10 faculty also feel that their productivity as teachers and as scholars/researchers has benefited a moderate amount or a great deal. Among students who reported having accessed information electronically, more than 9 in 10 feel that their ability to do this has been moderately or very useful in doing their school work.

Reflecting the relative newness of the technology, networking has provided variable benefit so far and is the area of least perceived accomplishments.

Reflecting differences among institutions in network access, the benefits that technology has provided in accessing information resources and in contacts with colleagues vary substantially by type of institution, with faculty at 2-year schools perceiving considerably fewer benefits than those at 4-year schools (especially the doctoral universities).

Very few faculty perceive that their contacts with students have benefited very much from technology. Only 10 percent believe there has been a great deal of benefit, and 19 percent rate the benefit as Òmoderate.Ó Similarly, only a third of respondents to the Chief Academic Officer questionnaire believe their school has done a moderately or very good job in using communications technologies such as e-mail and networking to increase the frequency, convenience, and/or quality of student-faculty interactions. Differences among institutions on these items parallel differences in network access.

Although insufficient funds are by far the most significant barrier to increased use of technologies, very large majorities expect most areas of technology to increase and perceive technology as having considerable potential.

Among all respondent groups at all types of institutions, by far the most significant barrier to the increased use of computers, AVM technologies, and technology-based distance education is insufficient funds. Two-thirds of respondents to the Chief Academic Officer questionnaire rate this as a major barrier, and another quarter rate it as a moderate barrier. No other item is rated as a major barrier by more than 40 percent of respondents.

Nevertheless, respondents to the Chief Academic Officer questionnaire at essentially all institutions, across all types, expect that the number of faculty who use computers for on-campus instructional purposes will increase over the next 3 years. Substantial majorities also expect that most types of computer-related expenditures will increase over that time. At least 8 in 10 expect that expenditures for PC, campus network infrastructure , and Internet infrastructure will increase; similar percentages believe that instructional uses of video and multimedia technologies will increase. Nine in 10 think that the number of technology-based distance education courses that their institution offers will increase.

Eight in 10 respondents also believe that computer networks and classroom uses of audio, video, and multimedia technologies have Òa great dealÓ of potential to help meet their institutionÕs instructional mission.

Type of school and age are the key determinants of computer use among faculty.

Faculty in doctoral schools and those under age 50 tend to be the most frequent computer users, while those in 2-year schools and those age 50 or over are the least frequent computer users. Among faculty in doctoral institutions, 82 percent use a computer more than once a week, compared with 65 percent of faculty in comprehensive schools and 61 percent of those in public 2-year schools. By age, 77 percent of those under 50 use a computer more than once a week, compared with 68 percent of those age 50 to 59, and 55 percent of those age 60 or over.

Student computer use is determined largely by academic major.

Although there are some differences in frequency of student computer use by type of school, the largest differences are by academic major. On this dimension, the proportion who use computers to do school work more than once a week ranges from 23 percent of health sciences majors to 66 percent of computer science, mathematics, or engineering majors. There are no appreciable differences in frequency of computer use by race/ethnicity, and differences by gender are attributable largely to the preponderance of men among computer science, math, and engineering majors.

Generational differences are evident in computer use.

In spite of the fact that higher percentages of faculty than students reported using computers, the survey found evidence that suspected generational differences in comfort with the new technologies exist even in academia. On the various question-naires answered by institutional-level spokespersons, inadequate faculty technical/computer skills are perceived to be a considerably larger barrier to greater technology use than are inadequate student skills. For example, 55 percent of respondents to the Chief Academic Officer questionnaire rate faculty skills as a moderate or major barrier, but only 29 percent rate student skills as a moderate or major barrier.

The institutional sample consisted of the following:

- **Public and Private Doctoral Institutions.** Research and other doctorate-granting universities. (The so-called Òresearch universitiesÓ comprise the 100 leading universities in federal research funds, and each awards substantial numbers of doctorates across many fields.)
- **Public and Private Comprehensive Institutions.** Offer liberal arts and professional programs, and a masterÕs is the highest degree conferred.
- **Liberal Arts Colleges.** Relatively smaller and, on the whole, more selective than comprehensive colleges and universities, these colleges primarily offer bachelorÕs degrees, although some offer masterÕs degrees. (Almost all are private.)
- **Public and Private 2-Year Colleges.** With only an occasional exception, the highest degree offered by these schools is an associate degree.

The table below shows the total number of institutions as of 1993 and the survey sample sizes for the various institutional types. (The sample sizes were developed with the objective of obtaining comparable sampling errors for each type of institution.) At the institutional level, six separate questionnaires were developed to address instructional uses of computers, instructional uses of AVM technologies, use of technologies in teacher education, use of computers in the library, use of technologies in distance education, and perspectives of the office of the Chief Academic Officer.

Two thousand full-time regular faculty members at a total of 100 institutions were surveyed. (Full-time regular faculty typically do not include acting, affiliate, adjunct, visiting, or emeritus faculty, or those who have research-only appointments.) No faculty were sampled from private 2-year institutions because the total number of faculty in these schools is very small. For each other type of institution, the size of the sample is proportional to the size of the population. Individuals were randomly selected from lists provided by participating institutions or faculty/staff directories.

The institutional and faculty surveys were conducted by mail questionnaire. Data were collected between January and October 1994, beginning with telephone contacts with each sampled institution to identify prospective respondents to each institutional questionnaire and, as appropriate, a list of the faculty. Data collection procedures included an initial questionnaire mailing, at least two follow-up mailings, telephone reminder calls, and in some cases completion of the questionnaire by means of a telephone interview. Response rates ranged from 71 percent to 82 percent.

The student perspective was obtained through a nationwide telephone survey of a random sample of households, selected through a random-digit-dialing process. The interviewing was conducted in July 1994. Individuals who had completed two or more for-credit courses in the past 6Êmonths were included in the survey. In households that included two or more students, one student was randomly selected to be interviewed. A total of 1,005 student interviews were conducted.

Weights were applied to the survey response to enable us to provide accurate projections to the relevant populations. Institutional responses were weighted by type of institution, faculty responses were weighted by type of institution and education vs. non-education program area, and student responses were weighted by number of students in the household.

Among the 1,000 schools in the overall survey sample, 599 were identified as offering majors and/or degrees in teacher education. Completed Teacher Education questionnaires were received from 429 institutions, including 24 2-year schools (21 public and 3 private). Because there are so few 2-year school responses and because their teacher education course offerings tend be to much more limited than those offered in 4-year schools, they have been excluded from the analyses reported here.

Education faculty data reported here are based on responses from 216 faculty members in departments or schools of education at 58 of the 70 4-year institutions included in the faculty sample. (The two faculty respondents who are in education departments at 2-year schools are not included.) Education student data reported here are based on responses from 79 students who reported that they were education majors (other than physical education, basic education, or continuing education) and that they attended a 4-year school. Note that although the faculty and student education respondents taught or majored (respectively) in education, they did not necessarily focus on teacher education. For example, they might have focused on education administration or education research.

If you have questions about this study, please refer them to Wendy Charlton, (202) 879-9672, fax (202) 783-1019 or e-mail wcharlton@cpb.org. If you would like a copy of the study, please contact Ric Schooley in CPB's Office of Publications via e-mail (rschooley@cpb.org), fax (202) 783-1019 or mail.

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CONTENTS

PREFACE v

I. OVERVIEW 1

Introduction 1

Who Was Surveyed 1

Major Survey Topics 1

Who Conducted the Study 3

Data Analyses 3

Organization of This Report 4

II. PROFILE OF THE STUDY POPULATIONS AND SAMPLES 5

Introduction 5

Sampling Strategies 5

Overview of Weighting Procedures 7

Respondent Profiles 7

III. INSTRUCTIONAL USE OF COMPUTERS 21

Introduction 21

General Use by Faculty and Students 21

Computer-Based Classroom Presentations 25

Use of Computer Labs and Classrooms 27

Microcomputer Software 28

Training in Computer Use 30

Availability and Ownership of Computer Hardware and Software 34

Computer-Related Policies 41

Perceived Benefits of Computers and Other Instructional Technologies 46

Computer-Related Accomplishments 51

Barriers to Increased Use of Computers for Instructional Purposes 55

Expectations for the Future 66

IV. COMPUTER NETWORKS 71

Introduction 71

Faculty and Student Use of Network Services 71

Campus Computer Networks 76

Community Computer Networks 84

Internet/Bitnet 85

Faculty and Student Training in Computer Networks 90

Telephone and Voice Mail Systems 91

Benefits and Accomplishments to Date 92

Barriers to Increased Use 94

Expectations for the Future 94

V. AUDIO, VIDEO, AND MULTIMEDIA INSTRUCTIONAL TECHNOLOGIES 97
Introduction 97
Use by Faculty and Students 97
Video Courses 105
Computer-Integrated Multimedia Courses 106
Faculty Development of AVM Instructional Materials 106
Faculty Training 107
Availability of AVM Equipment 108
AVM Instructional Technology Facilities 112
Central Collections of AVM Software 113
Video Reception Equipment 114
Broadcasting and Cable Network Operations 116
AVM Production 117
AVM Instructional Technology Policies 119
Institutional Leadership in AVM Instructional Technologies 122
Accomplishments to Date 123
Barriers to Increased AVM Technology Use 124
Institutional Plans and Expectations 128

VI. INSTRUCTIONAL TECHNOLOGIES IN THE LIBRARIES 133
Introduction 133
Electronic Access to Library Services 133
Instructional Technology Library Materials 137
Electronic-Format Journals 138
Networking 139
Electronic Publishing 142
Training Provided to Library Patrons 143
Institutional Leadership in Access to Electronic Databases 144
Changes Made to Support Electronic Access to Materials 145
Cooperative Practices with Other Institutions 146
Barriers to Increased Automation 147
Expectations Regarding Future Expenditures 150

VII. USE OF COMPUTERS AND AVM INSTRUCTIONAL TECHNOLOGIES IN TEACHER EDUCATION DEPARTMENTS 153
Introduction 153
Types of Teacher Education Students 154
Distance Education Courses 155
Training in Instructional Uses of Computers 155
Faculty and Student Computer Use and Availability 164
Training in Instructional Uses of AVM Technologies 170
Faculty and Student Use of AVM Technologies 176
Technology-Related Accomplishments 178

Barriers to Increased Use of Computers and AVM Instructional Technologies 181
Expectations for the Future 184

VIII. USE OF INSTRUCTIONAL TECHNOLOGIES 185
Introduction 185
Overall Scope of Distance Education 185
Print-Based Correspondence Courses 186
Technology-Based Distance Education Courses 187
Assistance/Training Provided to Distance Education Students and Faculty 198
Distance Education Facilities and Equipment 200
Organizational Aspects of Distance Education Programs 202
Institutional Policies 203
Funding Issues 204
Accomplishments Related to Distance Education 206
Barriers to Increased Use of Technology-Based Distance Education 207
Expectations for the Future 209

IX. SURVEY DESIGN AND METHODS 211
Introduction 211
Questionnaire Development 211
Survey Sampling Methods and Design 212
Institutional Recruitment 216
Survey Data Collection 217
Data Processing 217
Weighting Procedures 217
Data Analyses 218
Reporting 218

APPENDICES
A. Advisory Panel Members
B. Survey Questionnaires

PREFACE

This report describes the results of the 1994 Study of Communications Technology in Higher Education. This study is the third in a series of comprehensive, national studies of the use of instructional technologies in American colleges and universities.

The first Higher Education Utilization study was conducted in 1979. Cosponsored by the Corporation for Public Broadcasting (CPB) and the National Center for Education Statistics (NCES), the study examined only the instructional uses of television by U.S. colleges and universities.

The second Higher Education Utilization study, also cosponsored by NCES, was conducted in 1985, and expanded its scope to include other video, audio, and computer technologies and the utilization of these technologies in teacher education programs.

In designing the present study, CPB attempted to take into account the explosive growth that has occurred in the intervening 9 years in both the types of technology available and the extent of their use in institutions of higher education. The scope of the study was expanded to include newer technologies, such as computer networks and multimedia, as well as the use of instructional technologies in libraries and distance education programs. Just as important, the study included surveys of faculty and students in addition to institutional representatives, recognizing the trend toward decentralization of control of instructional technology in American higher education.

I extend my sincere appreciation to all those who contributed to the success of this study. This effort simply would not have been possible without the kind assistance of our Study Advisory Panel, who gave so generously of their time and effort through countless hours of survey instrument development and draft review. The names of the panel members are listed in Appendix A. I am also indebted to my colleagues here at the Corporation for Public Broadcasting and to Susan Russell and her associates at SRI International, who were responsible for the smooth conduct of survey operations.

My thanks also go to my colleagues at the national education associations that endorsed this study:

American Association of Colleges for Teacher Education

American Association of Community and Junior Colleges

American Association for Higher Education

American Association of State Colleges and Universities

Association of American Colleges

CAUSE

Council of Independent Colleges

Educom

National Association of State Universities and Land-Grant Colleges

National University Continuing Education Association

Finally, an expression of gratitude is due to the thousands of students, faculty, and administrators who took the time and effort to respond to the surveys. Without their generous assistance, this study would not have been possible.

Wendy Charlton
Project Director
Corporation for Public Broadcasting

I. OVERVIEW

INTRODUCTION

The 1994 Study of Communications Technology in Higher Education (CTHE) was a nationwide survey of colleges and universities about the use of instructional technologies such as microcomputers, audio/video materials, computer networks, distance education, and so on. The purpose of the study was to provide a comprehensive picture of the availability and use of instructional technologies in colleges and universities of all kinds. The study provides comprehensive and current information that can help educators, policy makers, and funders and producers of educational programming evaluate current technology uses and develop plans for expanded and more effective uses. Individual colleges and universities also can use the study results to better understand how their uses of instructional technologies compares with those of other institutions.

WHO WAS SURVEYED

- Up to six institutional-level spokespersons at each of 1,000 randomly selected colleges and universities.
- A total of 2,000 faculty in a random subset of 100 institutions.
- 1,005 full- and part-time college and university students, identified through a nationwide random sample survey of households.

MAJOR SURVEY TOPICS

Institutional-Level Surveys

- **Instructional Uses of Computers in Higher Education**
  - Overall use of computers (from micros to mainframes) by faculty and students.
  - Computer facilities and equipment.
  - Major types of computer applications.
  - Computer labs and training.
  - Intracampus computer networks and network services.
  - Institutional computer-use plans and policies.
  - Barriers to increased use of computers for instructional purposes.
- **Instructional Technologies in the Classroom**
  - Level of instructional use by faculty of various types of audio, video, and multimedia technologies.
  - Media support services offered to faculty or others (training, consultation, etc.).
  - Availability of audio/video/ multimedia equipment and facilities on campus.
  - Institutional plans and policies regarding instructional technologies.
  - Barriers to increased use of instructional technologies.
- **Distance Education**
  - Types and number of distance education courses taught and received.
  - How video telecourses are distributed.

  - Technologies used in distance education courses.
  - Institutional plans and policies regarding distance education.
  - Barriers to increased use of distance education.
- **Computer-Based Technologies in Libraries**
  - Remote access to libraries, networking, and CD-ROMs.
  - Availability and use of on-line public access catalogs.
  - Availability and use of electronic journals.
  - Availability and use of microcomputers in the library.
  - Institutional plans and policies regarding computer-based technologies in the library.
  - Barriers to increased use of computers and other instructional technologies in the libraries.
- **Computer-Based Technologies in Teacher Education**
  - Types of training in instructional use of computers offered and required.
  - Availability and use of audio, video, and multimedia equipment/technologies.
  - Likely trends regarding computer-based technologies in teacher education.
  - Barriers to increased use of computers and other instructional technologies in teacher education.
- **Chief Academic Officer Survey**
  - General institutional policies regarding access to and use of various types of instructional technologies.
  - Locus of campus leadership for various instructional technology issues.
  - Likely trends in faculty/student use of various types and uses of instructional technologies.
  - Barriers to increased use of computers and other instructional technologies.

Faculty Survey

- Availability, use, and ownership of computers.
- Use of computer software for research or instruction-related purposes.
- Access to and use of computer networks.
- Required student uses of computer software and network services.
- Use and development of audio, video, and multimedia materials for instructional purposes.
- Training in computers and other instructional technologies.
- Perceived benefits of instructional technologies.
- Barriers to respondent's increased use of computers and other instructional technologies.
- Demographic and academic characteristics.

Student Survey

- Availability, use, and ownership of computers.
- Use of computer software in doing school work.
- Access to and use of computer networks.
- Use of audio, video, and multimedia materials in the classroom.
- Training in computers and other instructional technologies.
- Perceived benefits of instructional technologies.
- Barriers to respondent's increased use of computers and other instructional technologies.
- Demographic and academic characteristics.

WHO CONDUCTED THE STUDY

The study was sponsored by the Corporation for Public Broadcasting, which contracted with SRI International to conduct the study.

About the Corporation for Public Broadcasting (CPB)

CPB is a private, nonprofit corporation created by Congress to oversee the growth of high-quality, taxpayer-supported, public radio and television. It operates independently, neither as a membership organization of public broadcasting stations nor as a government agency. Most of the federal government's contribution to CPB is distributed through grants to qualified noncommercial radio and television stations for public broadcasting program production and distribution, and for research and planning.

CPB supports a wide range of educational activities through its grants programs and through its support of national distribution and interconnection systems for educational programming. Through the Annenberg/CPB project, it provides major funding for the production and distribution of postsecondary educational materials.

One of CPB's essential roles is to gather, interpret, and distribute data about public broadcasting and educational telecommunications in the United States. For two decades, CPB has sponsored an ongoing program of research designed to provide a comprehensive picture of the availability and educational uses of communications technology at all levels, including elementary and secondary schools, colleges, and universities, and within the household. The intent of these survey efforts has been to provide policy-makers and educators with a comprehensive, ongoing picture of the uses and future potential of communications technology as a means of delivering educational services.

This study is the third in a series of studies on technology use in higher education sponsored by CPB. The first two studies, conducted in 1979 and 1985, were cosponsored by the National Center for Education Statistics. Much has changed in the 9 years since the last study, and the present effort has been expanded to include distance education, computer networking, use of communication technologies in libraries, and a host of other new developments in educational uses of technology. In addition, faculty and students have been included in the study for the first time.

CPB's aim in sponsoring the study is to collect current, comprehensive data that measure the availability and use of instructional technologies in American colleges and universities. Data from the study will not only help CPB plan for the future of public telecommunications services, but also help educators, policy-makers, and funders and producers of educational programming develop better and more effective products.

About SRI International

Formerly Stanford Research Institute, SRI is a nonprofit research organization. Its main offices are in Menlo Park, California, near Stanford University. Other offices are located elsewhere in the United States, Europe, and Asia. SRI has about 2,000 staff members, who conduct a wide variety of research and consulting activities in the physical, life, and social sciences, in engineering, and in management consulting.

DATA ANALYSES

Survey responses were weighted to allow for accurate generalizations to the populations of institutions, faculty, and students who were surveyed. Most significantly, institutional responses were weighted to reflect the actual distribution of institutions in the United States--that is, in general, relatively few doctoral universities and many liberal arts and (especially) public 2-year colleges.

Survey results are discussed for all respondents (to a given survey) combined and, as appropriate, by type of institution and (for students and faculty) by various demographic and academic characteristics. The study methods are discussed in detail in Chapter IX.

ORGANIZATION OF THIS REPORT

The remainder of this report is organized as follows: Chapter II provides a profile of the survey populations and respondents (institutions, faculty, and students). Chapters III, IV, and V describe the survey results concerning on-campus uses of computers; computer networks; and audio, video and multimedia instructional technologies, respectively. In Chapter VI, uses of computers and other instructional technologies in the libraries are described. Chapter VII covers the use of instructional technologies in teacher education. Chapter VIII deals with distance education. In Chapters III through VIII, relevant results from the faculty and student surveys are described, as well as the institutional survey results. Finally, Chapter IX describes the survey methods.

II. PROFILE OF THE STUDY POPULATIONS AND SAMPLES

INTRODUCTION

CTHE surveyed up to six institutional-level spokespersons at each of 1,000 randomly selected 2- and 4-year colleges and universities; 2,000 full-time regular faculty members in a random subset of 100 institutions; and 1,005 full- and part-time college and university students, identified through a nationwide random-sample survey of households. This chapter provides an overview of the sampling strategies (more detail is provided in Chapter IX) and profiles of the responding institutions, faculty, and students.

SAMPLING STRATEGIES

Institutional Sample

The sample comprised the following types of schools:

- **Public and private doctoral institutions.** These groups comprise research and other doctorate-granting universities. (The so-called "research universities" are the top 100 universities in receipt of federal research funds, and each awards substantial numbers of doctorates across many fields.)
- **Public and private comprehensive institutions.** These schools offer liberal arts and professional programs, and a master's is the highest degree conferred.
- **Liberal arts colleges.** Relatively smaller and, on the whole, more selective than comprehensive colleges and universities, these colleges offer primarily bachelor's degrees, although some offer master's degrees. (Almost all are private.)
- **Public and private 2-year colleges.** With only an occasional exception, the highest degree offered by these schools is an associate degree.

Note that the study did **not** include institutions whose primary purpose is to offer religious instruction or train members of the clergy, or other specialized institutions, including medical, other professional, and other specialized degree-granting colleges and universities. Exhibit II-1 shows the total numbers of institutions as of 1993 and the survey sample sizes for the various institutional types. (The sample sizes were developed with the objective of obtaining comparable sampling errors for each type of institution.)

Exhibit II-1

TOTAL 1993 INSTITUTIONS AND SURVEY SAMPLE SIZES, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
Population[a]	134	77	333	261	579	970	154	2,508
Sample	105	70	160	140	190	220	115	1,000

[a] Source: *1994 Higher Education Directory*, Higher Education Publications, Inc., 1994.

Faculty Sample

To obtain the faculty perspective, 2,000 full-time regular faculty members at 100 institutions were surveyed. (Full-time regular faculty typically do not include acting, affiliate, adjunct, visiting, or emeritus faculty, or those who have research-only appointments.) No faculty were sampled from private 2-year institutions because the total number of faculty in these schools is very small. For each other type of institution, the size of the sample is proportional to the size of the population. For example, 30 percent of the total (full-time regular) faculty are in public doctoral institutions, so 30 percent of the faculty sampled are in public doctoral institutions. Exhibit II-2 shows the faculty populations and sample sizes by type of institution.

Exhibit II-2

POPULATION AND SAMPLE OF FULL-TIME REGULAR FACULTY, 1993 BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
Population[a]	152,279	56,097	104,899	38,757	42,097	111,627	n.a.	505,756
Sample	602	222	414	154	166	442	0	2,000

[a] Source: *1994 Higher Education Directory*.

Faculty names provided by participating institutions were categorized into the 11 program areas specified by the National Center for Education Statistics for the 1993 National Survey of Postsecondary Faculty: agriculture, business, computer science/math/statistics, education, engineering, fine arts, health sciences, humanities, natural sciences, social sciences, and other. Next, a systematic random sample of individuals was selected for the survey. Since CPB was especially interested in responses from education faculty, this group was oversampled.

Student Sample

The student perspective was obtained through a nationwide telephone survey of a random sample of households, selected through a random-digit-dialing (RDD) process. The interviewing was conducted in July 1994. Individuals who had completed two or more for-credit courses in the past 6 months were included in the survey. In households that included two or more students, one student was randomly selected to be interviewed. A total of 1,005 student interviews were conducted.

OVERVIEW OF WEIGHTING PROCEDURES

Because none of the survey samples comprised a simple random sample of the group of interest (institutions, faculty, or students), it was necessary to apply weights to the survey responses to enable us to provide accurate projections to the relevant populations. Institutional responses were weighted by type of institution, faculty responses were weighted by type of institution and education vs. non-education program area, and student responses were weighted by number of students in the household. The weighting procedures are described in Chapter IX. Except for reports of response rates, all results reported are based on weighted data.

RESPONDENT PROFILES

Institutions

Response rates. Up to six institutional-level questionnaires were sent to each sampled institution, as applicable for that institution. (For example, only schools that were identified during preliminary telephone calls as those that offer distance education courses were sent the distance education questionnaire.) Response rates ranged from 71 percent for the Computer questionnaire to 82 percent for the Library questionnaire. Exhibit II-3 shows the overall response rate for each questionnaire and number of institutions of each type that responded. The small numbers in some of the cells for the Distance Education and Teacher Education questionnaires reflect the fact that these questionnaires were not relevant to many schools. Response rates for the various types of institutions did not differ appreciably from one another.

Exhibit II-3

NUMBER OF INSTITUTIONS THAT RESPONDED TO EACH QUESTIONNAIRE, BY TYPE OF INSTITUTION, AND OVERALL RESPONSE RATES

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Instits.	Response Rate
Chief Academic Officer (CAO)	76	52	127	109	144	166	86	760	76%
Computer	75	50	106	93	132	172	84	712	71%
Distance Education	66	9	64	19	10	77	5	250	72%
Instructional Technologies	78	41	114	110	141	175	86	745	76%
Library	87	56	133	115	159	177	93	820	82%
Teacher Education	74	37	108	90	96	21	3	429	71%

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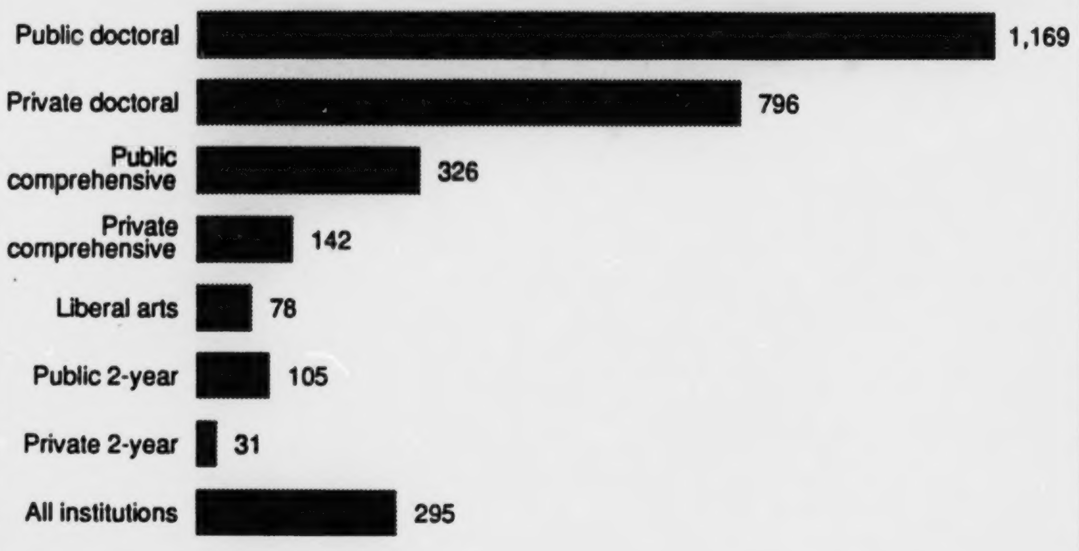
Type of institution. Type of institution was the primary analysis variable for the study. The results show many differences by institutional type, a number of which are very large. Typically, doctoral intitutions are the most likely to have/provide/offer the various technologies in question, and the 2-year schools, especially the private schools, are least likely to do so. In some cases, such as offering distance eduction courses, there are substantial public-private differences. (Public schools are much more likely than their private counterparts to offer distance education.)

Size of the faculty. As shown in Exhibit II-4, the average size of the (full-time regular) faculty varies substantially by type of institution, ranging from an average of almost 1,200 in public doctoral institutions to only 31 in private 2-year institutions. These size differences help to explain some of the differences by institutional type in survey responses. For example, questions that asked whether any of the institution's faculty engaged in a certain practice were considerably more likely to receive a positive response from large schools than from small schools, at least in part because the more faculty there are, the more likely it is that at least one of them does indeed engage in the practice in question. Also, the very large size of the faculty in public doctoral institutions helps explain the relatively high percentages of "have no idea" responses that institutional respondents from these schools gave on some of the questions about faculty behavior.

Exhibit II-4

MEAN NUMBER OF FULL-TIME REGULAR FACULTY IN RESPONDING INSTITUTIONS, BY TYPE OF INSTITUTION



Source: *1994 Higher Education Directory*

Geographic region. The various types of institutions are not evenly distributed across the geographic regions of the country (Exhibit II-5).

Exhibit II-5

PERCENTAGE DISTRIBUTION OF RESPONDING INSTITUTIONS BY GEOGRAPHIC REGION AND TYPE OF INSTITUTION

	Northeast	South	Midwest	West	All Regions
Public doctoral	5*	10	13	17	11
Private doctoral	15	3	4	7	7
Public comprehensive	12	23	12	16	16
Private comprehensive	18	12	14	13	14
Liberal arts	20	17	25	12	19
Public 2-year	15	23	23	30	22
Private 2-year	15	12	9	6	11
Total	100	100	100	100	100
All institutions	26	32	26	15	100

---

*I.e., 5% of responding institutions in the Northeast are public doctoral institutions.

- The **Northeast** has fewer than average public doctoral schools (5 percent of its schools are in this category, compared with 11 percent nationwide) but more than average private doctoral schools (15 percent vs. 7 percent).
- The **South** has a relatively low percentage of private doctoral schools (3 percent) but a relatively high percentage of public comprehensive schools (23 percent, vs. 16 percent nationwide).
- The **Midwest** has a relatively low percentage of private doctoral schools (4 percent) but a relatively high percentage of liberal arts schools (25 percent, vs. 19 percent nationwide).
- The **West** has relatively high percentages of public doctoral schools (17 percent) and public 2-year schools (30 percent, vs. 22 percent nationwide) but a relatively low percentage of liberal arts schools (12 percent).

These differences make analyses of survey results by geographic region problematic, since any "true" regional differences are confounded by differences that are due to type of institution, and the sample size is not large enough to analyze regional differences within each of the institutional types. For this reason, survey results are not presented by geographic region.

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Faculty

Response Rates

A total of 2,000 faculty were selected for participation in the survey. Of these, 232 were not full-time regular faculty, did not teach any for-credit courses during the 1993 Fall Term, or were no longer at the institution. Of the 1,768 remaining, 1,316 (74 percent) responded to the survey. Exhibit II-6 shows the numbers and percentages who responded, by type of institution.

Exhibit II-6

NUMBER OF FACULTY RESPONDENTS AND RESPONSE RATES, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	All Faculty
Number who responded	395	127	277	101	110	306	1,316
Response rate	76%	75%	73%	72%	74%	75%	74%

Academic Characteristics

To assess the representativeness of the faculty results, academic and demographic characteristics of CTHE respondents were compared, where possible, against the characteristics of faculty as assessed by the 1993 National Study of Postsecondary Faculty (NSOPF-93).[1] NSOPF-93 was a random-sample survey that obtained responses from over 25,000 faculty and instructional staff in 817 higher education institutions. It should be noted, however, that the NSOPF-93 sampling frames for both full-time faculty and institutions were somewhat more inclusive than the CTHE sampling frame,[2] so some differences between the two groups are to be expected.

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[1] *1993 National Study of Postsecondary Faculty. Faculty and Instructional Staff: Who Are They and What Do They Do?* U.S. Department of Education, Office of Educational Research and Improvement (NCES 94-346), October 1994.

[2] For example, NSOPF included religious and other specialized schools (excluded from CTHE). NSOPF full-time faculty repondents included full-time personnel whose regular assignment included instruction (including administrators who had some teaching responsibilities) and full-time individuals with faculty status whose regular assignment did not include instruction (such as research faculty). CTHE included only full-time regular faculty, as defined by the institution, who taught at least one for-credit course during the 1993 Fall Term.

Type of Institution. Thirty-nine percent of CTHE faculty respondents (after the survey weights have been applied) are in doctoral institutions, 28 percent are in comprehensive institutions, 23 percent are in public 2-year institutions, and 9 percent are in liberal arts institutions (Exhibit II-7). By comparison, faculty in doctoral institutions comprise a somewhat larger percentage of NSOPF-93 respondents (44 percent), and those in other types of institutions (except "other") comprise slightly smaller percentages. NSOPF's inclusion of specialized medical schools with other doctoral institutions accounts for at least some of the observed difference. (CTHE did not include specialized medical schools.)

In subsequent chapters of the report, faculty results by type of institution are presented for only three groups: doctoral, comprehensive, and public 2-year. The limiting factor in developing these groupings was not the number of respondents *per se* but rather the small number of institutions from which the respondents were selected. (For example, although there are 110 respondents from liberal arts schools, they are divided among only 8 schools.) Even with only three groups, however, many survey items produced statistically significant differences among faculty in different types of institutions, paralleling those found at the institutional level.

Exhibit II-7

PERCENTAGE DISTRIBUTION OF CTHE AND NSOPF-93 FULL-TIME FACULTY RESPONDENTS, BY TYPE OF INSTITUTION

	CTHE Respondents[a]	NSOPF-93 Respondents[b]
Public doctoral	29*	32
Private doctoral	10	12
Public comprehensive	21	17
Private comprehensive	7	6
Liberal arts	9	7
Public 2-year	23	20
Other	0	4

---

*I.e., 29% of CTHE faculty respondents are in public doctoral institutions. (Unless otherwise noted, all data presented in this and subsequent exhibits are weighted.)

[a] Full-time regular faculty.

[b] All full-time faculty and instructional staff. Respondents in doctoral institutions include those in specialized medical schools.

Sources: CTHE Faculty survey.
1993 National Study of Postsecondary Faculty.

Program area. Exhibit II-8 presents the distribution of CTHE and NSOPF-93 full-time faculty respondents across the eight program areas that were used in the survey analyses[3]: business; computer science, mathematics, statistics, and engineering (CSME); education[4]; health sciences; humanities; natural sciences; social sciences; and other (including agriculture and fine arts). In all areas except health sciences, the percentages are no more than 2 points different from one another. The higher percentage of health sciences faculty in the NSOPF sample represents NSOPF's inclusion (and CTHE's exclusion) of specialized medical schools.

The survey results show a number of differences by program area, usually showing relatively high computer use/access among faculty in CSME, natural sciences, and education and relatively low use/access among those in health sciences and humanities, and "other" areas. (Because of the often sizable differences between 2- and 4-year schools, program area results also were tabulated for 4-year schools only. These tabulations produced the same or very similar patterns of results as those that included all schools.)

Exhibit II-8

PERCENTAGE DISTRIBUTION OF CTHE AND NSOPF-93 FULL-TIME FACULTY RESPONDENTS, BY PROGRAM AREA

	CTHE Respondents[a]	NSOPF-93 Respondents[b]
Business	7	8
Computer science, math, statistics, and engineering (CSME)	14	13
Education	5	7
Health sciences	11	15
Humanities	15	14
Natural sciences	13	12
Social sciences	12	11
Other	22	20

*I.e., 7% of CTHE faculty respondents are in a business program area.

[a] Full-time regular faculty.

[b] All full-time faculty and instructional staff.

Sources: CTHE Faculty survey.
1993 National Study of Postsecondary Faculty.

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[3] The 11 categories used in the sampling process were aggregated to increase the sizes of the subgroups for analysis.

[4] Because education faculty were oversampled, the number of respondents in this program area (218) is larger than the weighted percentage suggests.

Tenure status and academic rank. Almost two-thirds of CTHE faculty respondents (63 percent) reported that they have received tenure. A fourth (24 percent) are on tenure track but not yet tenured, 6 percent are not on a tenure track, and 8 percent are in an institution that does not have a tenure system. Correspondingly, 60 percent of CTHE respondents reported that their academic rank is professor or associate professor (typically tenured positions), 24 percent are assistant professors, 7 percent are instructors or lecturers, and 9 percent are in an institution in which there are no designated academic ranks (Exhibit II-9). There are few appreciable differences in the survey results by either tenure status or academic rank.

Exhibit II-9

PERCENTAGE DISTRIBUTION OF CTHE AND NSOPF-93 FULL-TIME FACULTY RESPONDENTS, BY ACADEMIC RANK

	CTHE Respondents[a]	NSOPF-93 Respondents[b]
Professor (including distinguished/named professor)	36*	31
Associate professor	24	23
Assistant professor	24	23
Instructor or lecturer	7	16
Other	<1	3
Doesn't apply: No ranks designated at this institution	9	3

---

*I.e., 36% of CTHE faculty respondents indicated that they have the rank of professor.

[a] Full-time regular faculty.

[b] Full-time faculty and instructional staff.

Sources: CTHE Faculty survey, question 32.
1993 National Study of Postsecondary Faculty.

Thirteen percent of the CTHE faculty respondents held the position of department or division chairperson during the 1993 Fall Term, and another 1 percent were a dean, assistant or associate dean, or assistant, associate, or vice provost.

Demographic Characteristics

Gender. Slightly over two-thirds of CTHE faculty respondents (69 percent) are male, and 31 percent are female. These percentages are within one point of the NSOPF-93 figures (68 and 32 percent, respectively.) There are few appreciable differences in the survey results between men and women.

Age. Almost half (43 percent) of CTHE faculty respondents are age 50 or older (33 percent are age 50 to 59, and 10 percent are age 60 or older). Thirty-six percent are age 40 to 49, 20 percent are age 30 to 39, and only 1 percent are under age 30. NSOPF-93 age data are not available. The survey results show a moderate number of age-related differences, most often reflecting an inverse relationship between computer use/access and age. (Often, however, it is only the age 60+ group that is different from the others.)

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Race/ethnicity. In both the CTHE and NSOPF-93 surveys, whites comprised the great majority of respondents—82 percent of CTHE respondents and 86 percent of NSOPF respondents (Exhibit II-10). No other racial/ethnic group comprises more than 5 percent of the samples.

For analysis purposes, the racial/ethnic groups were collapsed into two categories: white/Asian/Pacific Islander ("Asians and whites"), and Black/Hispanic/Native American ("targeted minorities").[5] Asians and Pacific Islanders were combined with whites because their responses tended to be more similar to those of whites than to those of targeted minorities. The number of Asian/Pacific Islander respondents (50) is too small to report the results of this group separately.

As with age, there are a moderate number of statistically significant differences by race/ethnicity. The patterns of racial/ethnic differences, however, vary considerably across the survey items. In many cases, the differences are attributable at least partly to the fact that targeted minorities are less likely than Asians or whites to teach at the "high-tech" schools and in the "high-tech" program areas. For example, only 24 percent of targeted minorities teach at doctoral institutions, compared with 42 percent of Asians and whites, respectively. In the program areas, 9 percent of targeted minorities are in CSME, compared with 16 percent of Asians and whites. Conversely, 23 percent of targeted minorities are in humanities, compared with 14 percent of Asians and whites.

Exhibit II-10

PERCENTAGE DISTRIBUTION OF CTHE AND NSOPF-93 FULL-TIME FACULTY RESPONDENTS, BY RACE/ETHNICITY

	CTHE Respondents[a]	NSOPF-93 Respondents[b]
Asian or Pacific Islander	4*	5
Black/African-American	5	5
Hispanic/Latino	5	3
Native American/American Indian or Alaska Native	1	<1
Caucasian/White	82	86
Other	2	—

*I.e., 4% of CTHE faculty respondents are Asian or Pacific Islander.

[a] Full-time regular faculty.

[b] Full-time faculty and instructional staff.

Sources: CTHE Faculty survey, question 36.
1993 National Study of Postsecondary Faculty.

Students

As noted above, a total of 1,005 students (defined as those who had completed at least two for-credit higher education courses in the past 6 months) were interviewed as part of this study.[6] Below we describe their academic and demographic characteristics. Since this was the first time, to our knowledge, that a nationally representative sample of higher education students was obtained through an RDD survey of households, we were interested in comparing respondent characteristics with those of other current data sources. Comparison sources were the *1994 Higher Education Directory*, published by Higher Education Publishers (HEP), and the *Digest of Education Statistics, 1994*, published by the National Center for Education Statistics (NCES). As shown in the following subsections, the academic and demographic profiles of respondents are very similar to those for all higher education students, as published by HEP and NCES. Thus, we are confident that the respondent group accurately represents students as a whole.

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[5] "Targeted minorities" is a term that is often used in affirmative action contexts for these groups.

[6] Response rates were not calculated for the student survey because by far the largest portion of nonresponse on any RDD survey comes from phone numbers that are busy or not answered. Since an unknown, but probably large, percentage of these busy/no-answer numbers are actually nonworking numbers, calculation of a response rate is problematic.

Academic Characteristics

Type of institution. Student respondents were asked the name and location (city, state) of the college or university they attended during their most recent academic term. Their responses were then coded into the institutional types used for the institution survey, using the *1994 Higher Education Directory*. Exhibit II-11 shows the distribution of respondents by type of institution, compared with the 1990 distribution of all students enrolled in institutions included in the CTHE sampling frame. The respondent and universe distributions are very similar, except that students in public doctoral institutions are somewhat overrepresented by the survey (26 vs. 20 percent), whereas those in public 2-year institutions are underrepresented (30 vs. 40 percent).

Because the numbers of respondents in several of the groups are quite small, student responses by type of institution were analyzed according to the following four categories: doctoral, comprehensive, public 2-year, and other. Of the various student characteristics analyzed, type of institution proved to be the one that was most often related to student behaviors and attitudes.

Exhibit II-11

PERCENTAGE DISTRIBUTION OF STUDENT RESPONDENTS AND ALL STUDENTS IN 1990, BY TYPE OF INSTITUTION

	Student Respondents, Including "Other" Category	Student Respondents, Excluding "Other" Category	All 1990 Students Enrolled in the Study Universe[a]
Public doctoral	24*	26	20
Private doctoral	5	5	6
Public comprehensive	20	22	20
Private comprehensive	8	8	7
Liberal arts	7	7	6
Public 2-year	28	30	40
Private 2-year	1	1	1
Other/unknown[b]	7	—	—

---

*I.e., 24% of student respondents attended public doctoral institutions.

[a] Source: *1994 Higher Education Directory*.

[b] Includes students who attended schools that could not be identified in the *1994 Higher Education Directory* and those who attended schools not included in the study universe.

Full-time/part-time status. Two-thirds (68 percent) of the students interviewed reported that their school considered them to be enrolled full-time; 32 percent reported they were part-time students. NCES data show that in 1989 only 57 percent of students were full-time. Thus, it would appear that the survey overrepresents full-time students. This overrepresentation is explained at least in part by the survey's selection criterion that limited participation to those students who had completed at least two for-credit courses during the past 6 months. (Since full-time students are less likely to be enrolled in public 2-year schools than are part-time students, this finding is consistent with the finding noted above that public 2-year-school students appear to be somewhat underrepresented in the survey.)

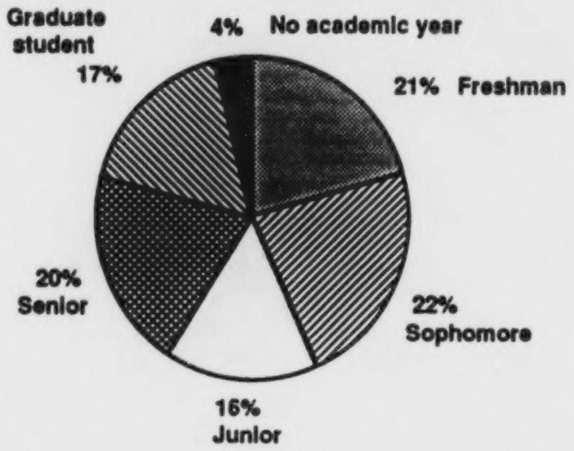
The survey results show a number of differences between full- and part-time students, but they are attributable largely to the relatively high percentages of part-timers (40 percent) at public 2-year schools and their correspondingly low percentages (20 percent) at doctoral institutions. As a group, part-time students also are substantially older than full-time students: 75 percent of part-time students are age 25 or older, compared with only 30 percent of full-time students.

Academic year. Exhibit II-12 presents the distribution of respondents by academic year. Almost half (43 percent) were freshmen or sophomores, about a third (36 percent) were juniors or seniors, and slightly less than a fifth (17 percent) were graduate students. The final 4 percent reported no academic year (e.g., they were not seeking a degree). NCES data do not include statistics on the undergraduate distribution, but they do indicate that 14 percent of 1992 students were graduate students—within sampling error of the CTHE percentage.

Initial analyses of survey responses by academic year found differences on many survey items. However, when students in 2-year schools were removed from the analysis, many of the differences disappeared. Academic-year differences reported in later sections include only those students who were attending 4-year schools.

Exhibit II-12

PERCENTAGE DISTRIBUTION OF STUDENT RESPONDENTS, BY ACADEMIC YEAR



Academic major. The distribution of respondents by academic major is presented in Exhibit II-13. The most common majors were business (15 percent), health sciences (12 percent) and social or behavioral sciences (10 percent). For analysis purposes, the 11 categories shown in Exhibit II-13 were aggregated into 7 categories: business; computer science, math, statistics, or engineering (CSME); education; health sciences; natural sciences; social sciences; and other.

The survey results show a number of differences in responses by academic major. Almost all of these relate to computer use, showing relatively high use among the CSME majors and, to a lesser extent, relatively low use among the health sciences majors. As with faculty program areas, some of these differences are affected by overall 2-year vs. 4-year school differences, so reports of results by academic major include only those students who are in 4-year schools.

Exhibit II-13

PERCENTAGE DISTRIBUTION OF STUDENT RESPONDENTS, BY ACADEMIC MAJOR

No major	8
Agriculture (including parks and recreation, wildlife or range management)	1
Business (including accounting, finance, management, marketing, organizational behavior)	15
Computer science, math, or statistics	7
Education (other than adult, continuing, or physical education or basic studies)	9
Engineering	6
Fine or performing arts (including crafts, dance, music, photography, speech)	4
Health sciences (including medicine, nursing, dentistry, pharmacy, veterinary medicine)	12
Humanities (including art or music history, English, literature, history, foreign languages, philosophy, religion	7
Natural sciences, other than health sciences (including astronomy, biology, botany, chemistry, ecology, environmental sciences, geology, physics, zoology)	8
Social or behavioral sciences (including advertising, anthropology, economics, government, political science, psychology, sociology)	10
Other fields (including adult, continuing, or physical education; basic studies; journalism; communication; law; library science; public administration; social work; theology; vocational training)	14

Source: CTHE Student survey, question 72.

Demographic Characteristics

Gender. Forty-two percent of survey respondents were men, and 58 percent were women. These percentages are very close to statistics reported in the *Digest of Education Statistics, 1994*, which indicated that 46 percent of 1993 higher education students were men. There tend not to be large gender differences in the survey results, and those that do exist reflect largely a preponderance of men among CSME majors (74 percent are men) and a preponderance of women among health science majors (81 percent are women).

Age. As shown in Exhibit II-14, the age distribution of survey respondents closely parallels that reported in the *Digest*. For example, 56 percent of survey respondents were between the ages of 17 and 24, while the *Digest* reported that 58 percent were under age 25. The survey results show a number of age-group differences. The patterns of these differences vary, reflecting a variety of life-situation differences among the age groups.

Exhibit II-14

PERCENTAGE DISTRIBUTION OF STUDENT RESPONDENTS AND ALL STUDENTS IN 1991, BY AGE

Survey Respondents (1):

17 to 20	21 to 24	25 to 34	35 to 44	45 to 54	55 or Older
26	30	26	12	5	1

All 1991 Higher Education Students (2):

Under 25	25 to 34	35 or Older
58	24	18

Sources: (1) CTHE Student survey, question 73.
(2) *Digest of Education Statistics, 1994.*

Race/ethnicity. The distribution of survey respondents by race/ethnicity also closely parallels NCES data (Exhibit II-15). Among survey respondents, 79 percent were white, 8 percent were Black, and 4 percent each were Hispanic and Asian/Pacific Islander. NCES data are no more than 3 percentage points different for any of the groups.

As with the faculty data, the student racial/ethnic groups were collapsed into two categories: white/Asian/Pacific Islander ("Asians and whites"), and Black/Hispanic/Native American ("targeted minorities"). Among the students, there no appreciable differences between the two groups in field of study, but Asians and whites are more likely than targeted minorities to attend doctoral institutions (30 vs. 19 percent) and less likely to attend public 2-year schools (27 vs. 35 percent). Some of the observed differences in survey responses are attributable at least partly to these differences.

Exhibit II-15

PERCENTAGE DISTRIBUTION OF STUDENT RESPONDENTS AND ALL 1992 HIGHER EDUCATION STUDENTS, BY RACE/ETHNICITY

	White	Black	Hispanic	Asian/Pacific Islander	Native American/ Alaska Native	Other	Refused
Survey respondents (1)	79	8	4	4	2	1	2
All students (2)	78	10	7	5	1	—	—

Sources: (1) CTHE Student survey, question 74.
(2) *Digest of Education Statistics, 1994*, U.S. citizens only

III. INSTRUCTIONAL USE OF COMPUTERS

INTRODUCTION

This chapter covers **on-campus** uses of computers for instructional purposes. (The use of computers in distance education courses is covered in Chapter VIII.) Questions covered in this chapter were asked in the Faculty, Student, Chief Academic Officer (CAO), and Computer questionnaires. See Chapter II for a description of the institutional, faculty, and student samples and respondents and definitions of the various types of institutions discussed below.

GENERAL USE BY FACULTY AND STUDENTS

Faculty Use

Almost all faculty now use computers, and they tend to use them regularly. Nine out of 10 full-time regular faculty members (90 percent) reported using a computer at least once during the 1993 Fall Term for research or instructional purposes, 7 out of 10 (71 percent) used one more than once a week, and half (52 percent) used one daily (Exhibit III-1). Faculty in doctoral institutions are the most likely to be frequent users—82 percent used a computer more than once a week, compared with 65 percent of faculty in comprehensive schools and 61 percent of those in public 2-year schools.[1]

Exhibit III-1

FREQUENCY OF FACULTY USE OF COMPUTERS FOR RESEARCH OR INSTRUCTION-RELATED PURPOSES DURING THE 1993 FALL TERM, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	All Faculty[a]
Never	▲5[*]	12	▲17	10
Once or twice	▲4	6	▲10	6
Less than once a week	▲3	▲8	6	5
About once a week	7	9	7	8
More than once a week (but less than daily)	18	19	21	19
Daily or more often	▲64	▲46	▲40	52

[*] I.e., 5% of faculty in doctoral institutions reported that they never used any kind of computer for research or instruction-related purposes during the 1993 Fall Term.

▲This percentage is statistically significantly different from that for faculty in all other types of schools combined ($p < .05$).

[a] Includes faculty in liberal arts colleges, which comprise too small a sample to report separately.

Source: Faculty questionnaire, question 17.

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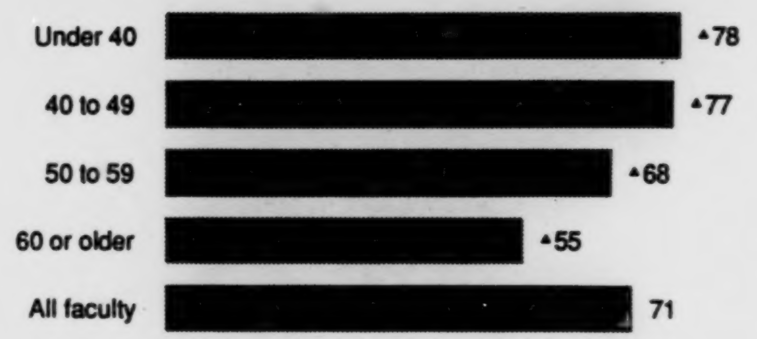
[1] Reminder: Because of sample size limitations, comparisons of faculty responses by type of institution include only three types of institutions: doctoral, comprehensive, and public 2-year. See Chapter IX for a more complete explanation.

Frequency of faculty computer use also is associated with age, academic rank, tenure status, and race/ethnicity, but not program area or gender. Younger faculty are more likely to be frequent computer users than are older faculty: 77 percent of those age 49 and under use a computer more than once a week, compared with 68 percent of those age 50 to 59 and 55 percent of those age 60 or over (Exhibit III-2). These age-related differences most likely are the determining factor in the differences by academic rank and tenure status. (Among assistant professors, associate professors, and nontenured faculty, 75 to 80 percent used computers more than once a week, whereas 67 and 68 percent of full professors and tenured faculty did so.) Similarly, the observed differences among the racial/ethnic groups in those who used a computer more than once a week (73 percent of Asians and whites vs. 64 percent of targeted minorities) are attributable largely to the higher percentage of Asians and whites than targeted minorities at doctoral institutions.

Exhibit III-2

PERCENTAGE OF FACULTY WHO USED COMPUTERS FOR RESEARCH OR INSTRUCTIONAL PURPOSES MORE THAN ONCE A WEEK DURING THE 1993 FALL TERM, BY AGE



*This percentage is statistically significantly different from that for all other age groups of faculty combined (p < .05).

Source: Faculty questionnaire, questions 17 and 35.

At the institutional level, both CAO and Computer questionnaire respondents tend to underestimate the level of faculty computer use, compared with faculty self-report. For example, only 26 to 34 percent of Computer questionnaire respondents at the various types of schools estimated that 75 percent or more of the faculty used computers more than once a week for research/instruction (Exhibit III-3), and only 19 to 31 percent of CAO respondents at these schools estimated that more than half of the faculty used computers in any of the 1993 Fall Term on-campus courses (Exhibit III-4).[2]

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[2] Note however, that because faculty (and students) are not evenly distributed among the nation's colleges and universities, faculty and student responses cannot be directly compared with institutional responses.

Exhibit III-3

COMPUTER-QUESTIONNAIRE ESTIMATES OF THE PERCENTAGE OF FACULTY WHO USE COMPUTERS MORE THAN ONCE A WEEK FOR INSTRUCTIONAL OR RESEARCH PURPOSES, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
Fewer than 25%	▲1*	▲2	▲6	8	13	10	▲21	10
25% to 49%	▲19	26	30	28	▲17	▲35	▲20	28
50% to 74%	▲44	36	31	32	31	27	27	30
75% to 90%	25	17	16	17	21	15	23	18
More than 90%	8	17	12	15	13	11	▲7	12
Have no idea	1	2	4	▲0	5	2	2	3

---

*I.e., 1% of public doctoral respondents estimated that fewer than 25% of their faculty used computers more than once a week for instructional or research purposes.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 4a.

Exhibit III-4

CAO-QUESTIONNAIRE ESTIMATES OF THE PERCENTAGE OF FACULTY WHO USED COMPUTERS IN ANY OF THEIR 1993 FALL TERM ON-CAMPUS COURSES, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
None	0*	0	0	0	1	0	▲5	<1
Fewer than 10%	9	▲14	6	7	8	5	8	7
10% to 25%	43	33	▲25	31	38	38	33	35
26% to 50%	▲19	▲20	35	34	31	33	29	31
More than 50%	19	31	▲31	24	21	23	25	24
Have no idea	▲11	2	3	3	1	1	▲0	2

---

*I.e., none of the public doctoral respondents estimated that none of their faculty used computers in any of their 1993 Fall Term on-campus courses.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: CAO questionnaire, question 12a.

Student Use

Student computer use also is widespread and tends to be quite frequent. The vast majority of students (84 percent) reported that they used a computer during the past academic term, and about half (46 percent) said they used a computer to do school work more than once a week. Only 18 percent said that they never used a computer for school work during the past academic term; 7 percent used one once or twice, 8 percent used one less than once a week, and 20 percent used one about once a week. Institutional-level estimates of student computer use also are high. Six in 10 Computer questionnaire respondents (59 percent) estimated that half of more of their institution's students used computers more than once a week for instructional or research purposes. Twenty-nine percent estimated that 25 to 49 percent of their students used computers more than once a week, and only 8 percent estimated that fewer than 25 percent of the students did so.

There are few differences by institutional type in the Computer-respondent estimates. However, according to the student responses, computer use tends to be somewhat higher than average at doctoral institutions and somewhat lower than average at public 2-year institutions (Exhibit III-5). Even here, though, the differences are not great. For example, the percentages who used a computer to do school work more than once a week ranged from 38 percent of public 2-year students to 53 percent of doctoral students. (The relatively low use at public 2-year schools reflects the greater percentage of part-time students at these schools. Overall, part-time students are less likely than full-time students to have used a computer for any purpose during the past term—72 vs. 87 percent.)

Exhibit III-5

STUDENT COMPUTER USE DURING THE PAST ACADEMIC TERM, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	Other	All Students
Used a computer for any purpose	▲94*	87	▲73	83	84
Used a computer to do school work more than once a week	▲53	49	▲38	44	46

*I.e., 94% of students in doctoral universities reported that they used a computer during the past academic term.

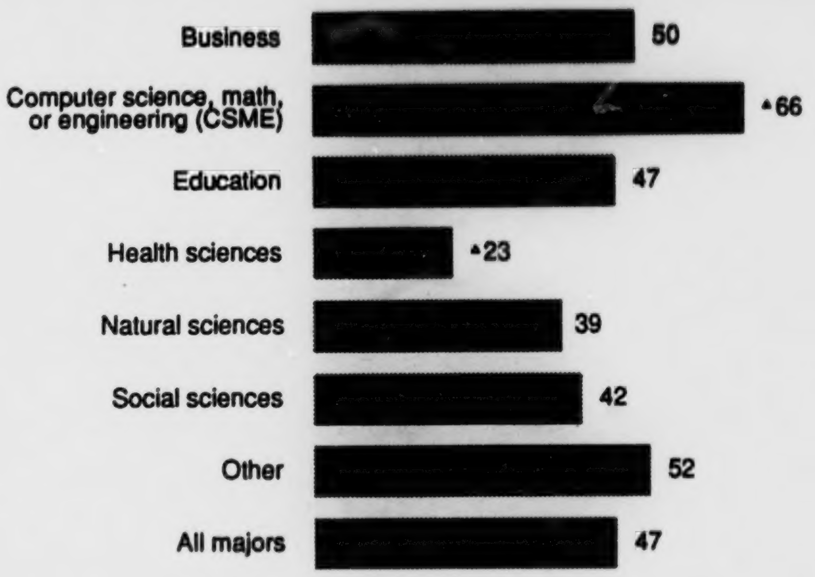
▲This percentage is statistically significantly different from that for students in all other types of schools combined ($p < .05$).

Source: Student questionnaire, questions 7 and 16.

The largest differences in frequency of student computer use are by academic major. On this dimension, the percentage who use computers to do school work more than once a week ranges from 23 percent of health sciences majors to 66 percent of computer science, mathematics, or engineering (CSME) majors (Exhibit III-6). Men also tend to be more frequent computer users than women (52 percent of men used computers more than once a week to do school work, compared with 43 percent of women), but this difference is attributable largely to the preponderance of men in CSME majors. There are no appreciable differences in frequency of computer use by race/ethnicity.

Exhibit III-6

PERCENTAGE OF STUDENTS WHO USED COMPUTERS TO DO SCHOOL WORK MORE THAN ONCE A WEEK DURING THE [illegible] ACADEMIC TERM, BY ACADEMIC MAJOR



▲This percentage is statistically significantly different from that for all other types of students combined (p < .05).

Source: Student questionnaire, questions 16 and 72.

COMPUTER-BASED CLASSROOM PRESENTATIONS

Three in 10 faculty members (29 percent) reported that they had used a computer in the classroom to give a demonstration or presentation[3] during the 1993 Fall Term, and 42 percent said they had done this at some time in the past (Exhibit III-7). Those in public 2-year schools are the most likely to have done so (36 percent did so during the 1993 Fall Term), whereas those in doctoral schools are least likely to have done so (25 percent). Among students, 41 percent reported having experienced a computer-based demonstration or presentation in the classroom during the most recent term they attended. Students in comprehensive schools are most likely to have had this experience (47 percent), and those in public 2-year schools are least likely to have done so (36 percent). (Since student and faculty percentages are not directly comparable, it is difficult to interpret the different patterns of responses from these two groups.)

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[3] For example, they might have used a computer rather than an overhead projector to display information.

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Exhibit III-7

INSTRUCTORS' USE OF A COMPUTER IN THE CLASSROOM TO GIVE A DEMONSTRATION OR PRESENTATION, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	Other	All Respondents
Faculty who used a computer in the classroom to give a demonstration or presentation (1)					
During the 1993 Fall Term	▲25*	29	▲36	n.a.	29
At some time in the past	▲37	43	▲48	n.a.	42
Students whose instructor used a computer in the classroom to give a demo/presentation in the past term (2)	42	▲47	▲36	40	41

---

*I.e., 25% of faculty at doctoral universities reported that they used a computer in the classroom to give a demonstration or presentation during the 1993 Fall Term.

▲This percentage is statistically significantly different from that for all other types of respondents combined (p < .05).

Sources: (1) Faculty questionnaire, question 23.
(2) Student questionnaire, questions 63g and 69.

Use of a computer in the classroom is most common among faculty in CSME and business program areas and among students in CSME and natural sciences (Exhibit III-8). It is relatively low among faculty in health sciences, social sciences, and especially humanities, and among students in health sciences and "other" fields of study.

Exhibit III-8

INSTRUCTORS' USE OF A COMPUTER IN THE CLASSROOM TO GIVE A DEMONSTRATION OR PRESENTATION, BY PROGRAM AREA/ACADEMIC MAJOR

	Bus.	CSME	Educ.	Health Sci.	Human-ities	Natural Sci.	Social Sci.	Other	All Areas
Faculty who used a computer in the classroom to give a demo/presentation during the 1993 Fall Term (1)	▲47*	▲47	35	▲15	▲9	29	▲22	33	30
Students whose instructor used a computer in the classroom to give a demo/presentation in the past term (2)	46	▲62	38	▲31	—	▲54	38	▲33	42

---

*I.e., 47% of faculty in business program areas reported that they used a computer in the classroom to give a demonstration or presentation during the 1993 Fall Term.

▲This percentage is statistically significantly different from that for all other types of respondents combined (p < .05).

—Too few respondents to provide a reliable estimate. Students who majored in humanities are included in the "Other" category.

Sources: (1) Faculty questionnaire, question 23.
(2) Student questionnaire, questions 63g and 72.

USE OF COMPUTER LABS AND CLASSROOMS

Almost all schools (96 percent) have rooms in which classes can meet that have computers for individual student use (e.g., computer labs that are sometimes used as classrooms). The typical school has a total of 104 PCs in these rooms (Exhibit III-9). The averages by institutional type range from a low of 42 in liberal arts colleges to a high of 191 in public doctoral universities. In general, private schools have fewer of these PCs than do their public counterparts, reflecting the fact that private schools have fewer students, on average.

Exhibit III-9

MEAN NUMBER OF MICROCOMPUTERS/WORKSTATIONS FOR INDIVIDUAL STUDENT USE IN COMPUTER LABS/CLASSROOMS, BY TYPE OF INSTITUTION

(Schools That Have Computer Labs/Classrooms)

Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
▲191	118	▲138	▲80	▲42	▲125	▲69	104

▲This mean is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 10.

During the 1993 Fall Term (for faculty) or the most recent term (for students), 28 percent of faculty and 41 percent of students taught/had classes in a computer lab classroom (Exhibit III-10). Thirty-nine percent of faculty have taught a class in a computer lab at some time in the past. Among both faculty and students, computer lab classes are least common at doctoral institutions.

Exhibit III-10

INSTRUCTORS' HOLDING OF CLASS SESSIONS IN A ROOM THAT HAS COMPUTERS FOR INDIVIDUAL STUDENT USE, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	Other	All Respondents
Faculty who used a room that has computers for individual student use to teach one or more class sessions (1)					
During the 1993 Fall Term	▲18*	31	▲40	—	28
At some time in the past	▲29	43	▲50	—	39
Students who in the past term had class sessions in a room that has computers for individual student use(2)	▲34	▲47	44	39	41

*I.e., 18% of faculty at doctoral universities reported that, during the 1993 Fall Term, they used a room that has computers for individual student use to teach one or more class sessions.

▲This percentage is statistically significantly different from that for all other types of respondents combined ($p < .05$).

Sources: (1) Faculty questionnaire, question 23.
(2) Student questionnaire, questions 63h and 69.

MICROCOMPUTER SOFTWARE

Faculty and Student Use

Word processing software is by far the most frequently used type of software. Large majorities of students (75 percent) and, especially, faculty (85 percent) used word processing software for school-related purposes during the past term or the 1993 Fall Term (Exhibit III-11). It is also the only kind of software that an appreciable percentage of faculty (37 percent) required their students to use to complete an assignment (comparable percentages for other kinds of software ranged from 2 to 18).

Exhibit III-11

FACULTY AND STUDENT USE OF COMPUTER SOFTWARE

(Listed in Descending Order of Faculty Use)

	During the 1993 Fall Term:		During the Past Academic Term:
	Faculty Used This for Research or Instruction-Related Purposes	Students Were Required to Use This to Complete One or More Assignments	Students Used This in Doing School Work
Word processing (WordPerfect, Word, etc.)	85*	37	75
Spreadsheets or other business applications (Lotus, Excel, etc.)	40	14	26
Graphics packages (Harvard Graphics, MacDraw, etc.)	33	10	22
Statistical analysis packages (Minitab, SPSS, SAS, Systat, etc.)	26	11	10
Instructional software designed to teach specific subject matter	22	18	13
Database packages (dBase, Paradox, etc.)	21	6	15
Desk-top publishing packages (PageMaker, QuarkXPress, FrameMaker, etc.)	15	4	15
Presentation programs (Powerpoint, Persuasion, etc.)	13	2	7
Engineering software (e.g., computer-assisted design)	9	6	8
Authoring tools (HyperCard, Toolbook, Linkway, etc.)	8	2	6
None of the above	12	49	20

---

*I.e., 85% of faculty reported that they used word processing software for research or instruction-related purposes during the 1993 Fall Term.

▲This percentage is statistically significantly different from that for all other types of respondents combined ($p < .05$).

Sources: (1) Faculty questionnaire, question 18.
(2) Student questionnaire, questions 17 through 19.

Several other kinds of software were used by sizable percentages (although less than half) of the faculty, including spreadsheets (40 percent), graphics packages (33 percent), statistical analysis packages (26 percent), instructional software for specific subject matter (22 percent), and database packages (21 percent). For each of these types of software use, student use is lower, but the relative order is about the same. Differences by institutional type for both faculty and students tend to parallel the overall computer-use patterns.

Institutional Software Site Licenses

According to the Computer questionnaire respondents, 87 percent of institutions have some kind of microcomputer site licenses for faculty or student use (Exhibit III-12). Reflecting the overall level of faculty/student software use, the most common licenses are for word processing software (76 percent) and spreadsheets (68 percent). Other relatively commonly held site licenses are for database packages (59 percent), statistical analysis packages (46 percent), instructional software designed to teach specific subject matter (40 percent), and desk-top publishing packages (34 percent). All others are held by fewer than a third of the institutions.

Exhibit III-12

MICROCOMPUTER SOFTWARE SITE LICENSES FOR FACULTY OR STUDENT USE

(Listed in Descending Order of Availability)

Word processing (WordPerfect, Word, etc.)	76*
Spreadsheets or other business applications (Lotus, Excel, etc.)	68
Database packages (dBase, Paradox, etc.)	59
Statistical analysis packages (Minitab, SPSS, SAS, Systat, etc.)	46
Instructional software designed to teach specific subject matter	40
Desk-top publishing packages (PageMaker, QuarkXPress, FrameMaker, etc.)	34
Communications (ProComm, Crosstalk, Telemate, etc.)	27
Engineering software (e.g., computer-assisted design)	25
Presentation programs (Powerpoint, Persuasion, etc.)	20
Authoring tools (HyperCard, Toolbook, Linkway, etc.)	19
None of the above	13

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*I.e., 76% of respondents reported that their institution has a site license for faculty and/or student use of word processing software.

Source: Computer questionnaire, question 11.

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TRAINING IN COMPUTER USE

Faculty Training

Half of the faculty (52 percent) have received formal training, such as workshops or courses in how to use general-purpose software (e.g., word processing, spreadsheets, operating systems, etc.), and about a third (31 percent) have received this training in the past 3 years (Exhibit III-13). Only about half as many have received formal training in how to use specific instructional software or courseware in their courses (25 percent; 18 percent in the past 3 years) or in the selection of instructional software or courseware (22 percent; 15 percent in the past 3 years).

For all types of training, faculty in public 2-year colleges are the most likely to have received it, whereas those in doctoral universities are the least likely to have done so. For example, about two-thirds of public 2-year-school faculty (64 percent) have received training in use of general-purpose software, compared with 57 percent of faculty in comprehensive schools and 40 percent of those in doctoral schools.

Exhibit III-13

FACULTY COMPUTER-USE TRAINING, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	All Faculty[a]
Received formal training in how to use general purpose software, such as word processing, spreadsheets, operating systems, etc.				
In the past 3 years	▲21*	33	▲44	31
At some time in the past	▲40	57	▲64	52
Received formal training in how to use specific instructional software or courseware				
In the past 3 years	▲8	19	▲30	18
At some time in the past	▲11	▲32	▲40	25
Received formal training in the selection of instructional software or courseware				
In the past 3 years	▲8	17	▲23	15
At some time in the past	▲12	▲28	▲31	22

---

*I.e., 21% of faculty in doctoral institutions reported that they received formal training in how to use general-purpose software in the past 3 years.

▲This percentage is statistically significantly different from that for all other types of faculty combined ($p < .05$).

[a] Includes faculty in liberal arts colleges, which comprise too small a sample to report separately.

Source: Faculty questionnaire, question 26.

As shown in Exhibit III-14, differences across program areas in the several types of training are less consistent than the differences across institutional types.

- **Formal training in the use of general purpose software.** This is most commonly received by education and business faculty, 65 and 70 percent of whom received such training at some time in the past, and least commonly received by those in CSME and natural sciences (40 percent).
- **Formal training in specific instructional software.** None of the program areas is higher than average in this, but social sciences faculty are less likely than others to receive it (19 percent have received this training at some time in the past).
- **Formal training in selecting instructional software.** Education faculty are more likely than others to have received this (31 percent), and humanities faculty are less likely to have received it (16 percent).

Exhibit III-14

FACULTY COMPUTER-USE TRAINING, BY PROGRAM AREA

	Bus.	CSME	Educ.	Health Sci.	Humanities	Natural Sci.	Social Sci.	Other	All Areas
Received formal training in how to use general-purpose software, such as word processing, spreadsheets, operating systems, etc.									
In the past 3 years	37*	▴24	▴43	32	29	25	30	36	32
At some time in the past	▴70	▴40	▴65	55	49	▴40	52	56	53
Received formal training in how to use specific instructional software/courseware									
In the past 3 years	24	22	21	14	▴13	16	▴11	22	18
At some time in the past	33	29	31	20	22	21	▴19	30	26
Received formal training in the selection of instructional software or courseware									
In the past 3 years	17	15	17	13	12	14	14	18	15
At some time in the past	24	23	▴31	24	▴16	21	20	26	24

---

*I.e., 37% of faculty business program areas reported that they have received formal training in how to use general-purpose software in the past 3 years.

▴This percentage is statistically significantly different from that for all other types of respondents combined ($p < .05$).

Source: Faculty questionnaire, question 26.

Student Training

It is a rare college that does not provide some kind of computer-use training or assistance to its students. Almost all (90 percent) of the students who used a computer for school work during the past term said that their school provides courses or assistance in general computer use, and half (49 percent) have received such assistance. Eight in 10 reported that courses or assistance are provided in using word processing software, and three-fourths (74 percent) said courses/assistance are provided in using other kinds of software. In each case, about half of those who reported that assistance is provided also reported that they themselves had received such assistance. There are few appreciable differences by institutional type, and no consistent patterns, in these responses. By academic major, students majoring in business were more likely than others to have received assistance. (For example, 58 percent of business students received assistance in general computer use.)

Similarly, institutional-level reports from Computer questionnaire respondents indicate that only 3 percent of institutions do not offer students some kind of computer-use training or assistance (Exhibit III-15). Most commonly provided are courses or formal training in the use of programming languages (provided by 81 percent of institutions) and in the use of specific applications software (80 percent). About three-fourths provide courses or formal training in the use of operating systems or graphical user interfaces such as Windows (73 percent). Orientation to the campus computer environment is the only area of assistance asked about that was more often provided informally (reported by 71 percent of respondents) than through courses or formal training (37 percent).

The patterns of differences by institutional type on these items are quite varied, and there are several anomalies. For example:

- **Public doctoral** universities are more likely than average to provide some kind of both formal and informal training, but they are less likely than average to provide courses or formal training in the use of programming languages.
- **Private doctoral** universities are more likely than average to provide informal assistance on each of the issues, but they tend to be about average in their provision of courses or formal training.
- **Liberals arts** colleges are less likely than average to offer most kinds of courses or formal training but more likely than average to require such courses or training. (Liberal arts colleges' relatively small size and narrow focus may make it easier for them to have college-wide requirements.)
- **Public 2-year** colleges tend to be more likely than average to offer most kinds of courses/formal training and less likely than average to offer informal assistance.
- **Private 2-year** colleges are less likely than average to offer most kinds of formal and informal training but more likely than average to require training. (As with liberal arts colleges, their small size and narrow focus probably play a role here.)

Exhibit III-15

COMPUTER-USE TRAINING AND ASSISTANCE PROVIDED TO STUDENTS, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Use of programming languages (Pascal, C, etc.)								
Courses or formal training offered	▴73*	73	85	85	▴72	▴87	▴67	81
Informal support/assistance offered	▴61	▴55	▴41	32	27	30	▴17	33
Courses/training required of all students	1	2	4	4	2	▴0	4	2
Use of specific applications software								
Courses or formal training offered	85	78	77	76	▴68	▴91	76	80
Informal support/assistance offered	▴84	▴82	62	62	59	▴50	▴41	57
Courses/training required of all students	▴1	▴6	10	17	▴22	▴6	▴19	12
Use of operating systems (DOS, UNIX, VMS, CMS, etc.) or graphical user interfaces (e.g., Windows)								
Courses or formal training offered	▴85	69	77	▴66	▴59	▴84	▴58	73
Informal support/assistance offered	▴85	▴90	▴66	63	59	▴45	▴39	56
Courses/training required of all students	▴0	6	▴6	10	▴17	▴7	▴20	10
Orientation to the campus computer environment								
Courses or formal training offered	▴66	▴55	38	41	34	▴31	36	37
Informal support/assistance offered	▴88	▴94	77	▴85	69	▴65	▴47	71
Courses/training required of all students	▴4	14	12	9	▴22	▴7	▴35	13
None of the above								
Courses or formal training offered	▴0	2	1	2	2	4	▴7	3
Informal support/assistance offered	▴0	▴0	1	2	2	4	▴7	3
Courses/training required of all students	14	10	11	11	12	15	13	13

---

*I.e., 73% of public doctoral respondents reported that the institution offers courses or formal training to students in use of programming languages.

▴This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 13.

AVAILABILITY AND OWNERSHIP OF COMPUTER HARDWARE AND SOFTWARE

Availability of Supercomputers, Mainframes, and Minicomputers

The vast majority of faculty (80 percent) have access to an institutional or departmental supercomputer, mainframe, or minicomputer (Exhibit III-16). However, this percentage varies considerably by type of institution, ranging from slightly over half of public 2-year-school faculty (57 percent) to almost all doctoral school faculty (91 percent.) The percentages of students who have mainframe access[4] are lower, but the pattern is the same. Across all types of institutions, 59 percent of students have access, ranging from 42 percent of public 2-year-school students to 77 percent of doctoral school students.

Exhibit III-16

PERCENTAGES OF FACULTY AND STUDENTS WHO HAVE ACCESS TO AN INSTITUTIONAL OR DEPARTMENTAL SUPERCOMPUTER, MAINFRAME, OR MINICOMPUTER, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	Other	All Respondents
Faculty	▲91*	81	▲57	—	80
Students	▲77	▲64	▲42	▲49	59

*I.e., 91% of faculty at doctoral universities reported that they have access to an institutional or departmental supercomputer, mainframe, or minicomputer.

▲This percentage is statistically significantly different from that for all other types of respondents combined ($p < .05$).

Sources: Faculty questionnaire, question 8
Student questionnaire, questions 14 and 69.

Responses from the Computer questionnaire respondents also show similar patterns (Exhibit III-17). Two-thirds of all institutions (68 percent) reported that supercomputers, mainframes, or minicomputers are available to at least some faculty, and 60 percent said they are available to at least some students.. There is substantial variation by type of institution, with availability to faculty ranging from a low of 22 percent of private 2-year colleges to essentially all public doctoral universities (99 percent).

---

[4] Because student access to mainframes can vary depending on the courses being taken, students were asked if they had access during the past term.

Exhibit III-17

INSTITUTIONAL REPORTS OF AVAILABILITY OF SUPERCOMPUTERS, MAINFRAMES, AND MINICOMPUTERS TO FACULTY AND STUDENTS, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Available to faculty	▲99*	▲92	▲90	73	▲60	64	▲22	68
Available to students	▲99	▲92	▲87	▲70	54	▲51	▲17	60

---

*I.e., 99% of public doctoral respondents reported that supercomputers, mainframes, or minicomputers are available to at least some of their faculty.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 1.

Ownership of Microcomputers

The vast majority of faculty (81 percent) and about half of the students (47 percent) own a computer, with moderate differences by type of institution (Exhibit III-18). For both groups, ownership is highest at doctoral institutions and lowest at public 2-year schools. Students are considerably more likely than faculty to plan to buy a computer in the next 12 months (17 percent vs. 4 percent).

Three-quarters of the faculty (74 percent) have a computer at home, and 30 percent own one at their office. Twelve percent have one that they take with them (e.g., a laptop).

Exhibit III-18

FACULTY AND STUDENT COMPUTER OWNERSHIP, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	Other	All Respondents
Faculty					
Own a computer now	▲86*	80	▲73	—	81
Don't own now but plan to buy in the next 12 months	3	3	6	—	4
Students					
Own a computer now	▲55	47	▲40	45	47
Don't own now but plan to buy in the next 12 months	14	16	19	18	17

---

*I.e., 86% of faculty in doctoral universities reported that they own a computer.

▲This percentage is statistically significantly different from that for all other types of respondents combined ($p < .05$).

Sources: Faculty questionnaire, question 4.
Student questionnaire, questions 9 and 10.

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Among faculty, PC ownership is not strongly related to any academic or demographic characteristics, although faculty in natural sciences and education are somewhat more likely than others to own a PC (87 percent do so). Also, faculty who are age 60 or older are less likely than their younger counterparts to own a PC (65 percent vs. 82 percent).

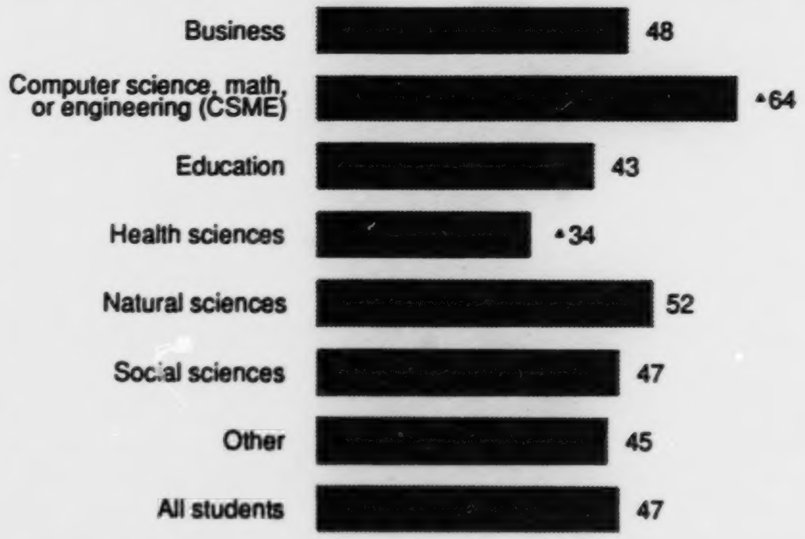
Among students, ownership is related to (in addition to type of institution) age, race/ethnicity, gender, academic major, and academic year. Students age 35 or older, whites and Asians, and men are more likely than their respective counterparts to own a computer:

- 60 percent of students age 35 or older own a computer, vs. 42 to 45 percent of the younger groups.
- 49 percent of whites and Asians own a computer, vs. 34 percent of Black, Hispanic, and Native Americans/Alaska Natives.
- 51 percent of men own a computer, vs. 44 percent of women.

By academic major, ownership is highest among CSME majors (Exhibit III-19), paralleling the results reported above regarding computer use. About two-thirds of CSME majors (64 percent) own a computer, compared with about half or less of the other majors. Ownership is lowest among health sciences majors (34 percent).

Exhibit III-19

PERCENTAGE OF STUDENTS WHO OWN A COMPUTER, BY ACADEMIC MAJOR



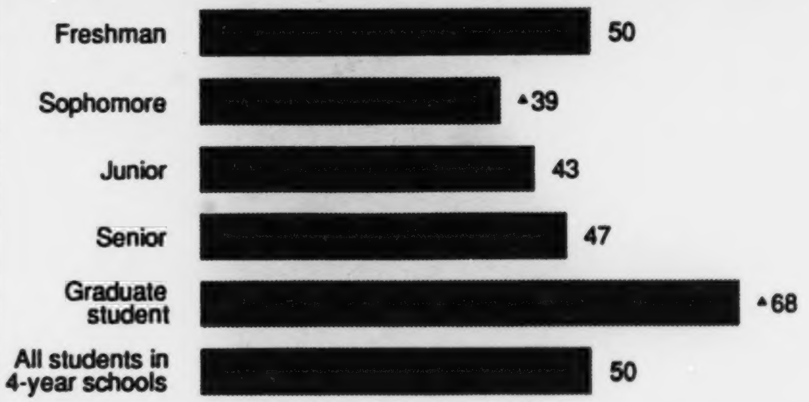
*This percentage is statistically significantly different from that for all other types of students combined ($p < .05$).

Source: Student questionnaire, questions 9 and 72.

By academic year (among students in 4-year schools), computer ownership is higher among graduate students (68 percent) than among undergraduates (39 to 50 percent) (Exhibit III-20). This difference is explained partly by the differences in age noted above.

Exhibit III-20

PERCENTAGE OF STUDENTS WHO OWN A COMPUTER, BY ACADEMIC YEAR (STUDENTS IN 4-YEAR SCHOOLS ONLY)



▲This percentage is statistically significantly different from that for all other types of students combined ($p < .05$).

Source: Student questionnaire, questions 16 and 70.

Availability of Microcomputers to Faculty and Students

Essentially all institutions of all types (96 to 100 percent), including the private 2-year schools, have microcomputers or workstations (PCs) of some kind available for use by least some faculty and students (Exhibit III-21). Stand-alone PCs (without hard-wired connections or dialup access to other computers) are the most likely to be available, and are equivalently available to faculty (85 percent) and students (83 percent). Private doctoral universities are considerably the least likely to provide stand-alone PCs, with only 64 percent providing them to faculty and 60 percent providing them to students.

A large majority of institutions also have PCs that are hard-wired to the institution's mainframes—80 percent provide them for faculty and 74 percent provide them for students—but there are considerably larger differences by institutional type for these kinds of PCs, ranging from a low of 49 percent of private 2-year colleges that provide them for students to highs of 97 and 98 percent of doctoral universities that provide them to both faculty and students.

PCs with dialup access to mainframes are the least common overall but show by far the most variability by type of institution. Overall, half of the institutions (51 percent) provide these to faculty and 37 percent provide them to students. At the low end, only 7 and 16 percent of private 2-year schools provide these kinds of machines for students and faculty, respectively. And at the high end, 81 percent of public doctoral schools provide them to students, and 89 percent provide them to faculty.

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Exhibit III-21

AVAILABILITY OF MICROCOMPUTERS AND WORKSTATIONS TO FACULTY AND STUDENTS, BY TYPE OF INSTITUTION

(Listed in Descending Order of Overall Availability)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Stand-alone microcomputers or work-stations, without hard-wired connections or dialup access to other computers								
Available to faculty	87*	▲64	88	88	83	86	▲76	85
Available to students	85	▲60	86	81	79	▲88	78	83
Microcomputers or work-stations with hard-wired connections to the institution's supercomputer, mainframe, or mini-computer, or to other microcomputers								
Available to faculty	▲97	▲98	▲94	▲89	75	▲76	▲59	80
Available to students	▲97	▲98	▲91	▲87	73	▲63	▲49	74
Microcomputers or workstations with dialup access to the institution's supercomputer, mainframe, or minicomputer								
Available to faculty	▲89	▲72	▲79	56	48	▲41	▲16	51
Available to students	▲81	▲70	▲70	▲49	34	▲20	▲7	37
Any of the above								
Available to faculty	100	100	100	▲100	98	98	96	98
Available to students	100	100	100	▲100	99	97	96	98

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*I.e., 87% of public doctoral respondents reported that stand-alone microcomputers or work-stations, without hard-wired connections or dialup access to other computers, are available to at least some of their faculty.

▲This percentage is statistically significantly different from that for all other types of institutions combined ($p < .05$).

Source: Computer questionnaire, question 1.

Seven in 10 faculty (69 percent) reported that their institution provides them with a microcomputer or workstation for their sole use. By type of institution, this percentage ranges from 50 percent among public 2-year faculty to 67 percent of comprehensive school faculty and 81 percent of doctoral school faculty. By program area, the percentage ranges from 58 and 63 percent of health sciences and humanities faculty, respectively, to 80 and 82 percent of business and education faculty, respectively. There are no appreciable differences by academic rank or tenure status.

Computer questionnaire responses indicate that 6 in 10 institutions (61 percent) provide sole-use PCs to at least half of their faculty (Exhibit III-22). Private 2-year schools are by far the least likely to provide PCs to their faculty (23 percent provide them to at least half of their faculty), whereas public doctoral schools are the most likely to do so (85 percent).

Exhibit III-22

PERCENTAGE OF INSTITUTIONS THAT PROVIDE FACULTY WITH A MICROCOMPUTER OR WORKSTATION FOR THEIR SOLE USE, BY TYPE OF INSTITUTION

Proportion of Faculty Provided Sole-Use Computer	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
None	1*	▲0	▲1	▲0	5	2	▲16	3
Fewer than 25%	▲3	12	▲4	▲9	18	▲22	▲45	17
25% to 49%	▲8	18	22	20	▲11	21	16	18
50% to 74%	▲41	22	19	15	21	18	▲5	19
75% to 90%	▲30	18	▲20	18	11	▲10	▲6	13
More than 90%	▲14	27	34	▲38	30	28	▲12	29

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*I.e., 1% of public doctoral respondents reported that the institution provides a sole-use microcomputer or workstation to none of their faculty. Column percentages may not sum to 100 because "have no idea" responses (all less than 5%) are not shown.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 2.

Far fewer students than faculty are provided with sole-use PCs by their school. Only 12 percent of students reported that they have sole use of a school-provided machine (Exhibit III-23). Another 24 percent reported that their school has open-access PCs that are available to them when needed. Hardly any students (2 percent) do not own or have access to a PC when they need one. There are few appreciable differences by institutional type in these percentages.

EXHIBIT III-23

STUDENT ACCESS TO MICROCOMPUTERS, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	Other	All Students
School provides computer for respondent's sole use	9*	15	11	10	12
Don't have sole use, but school has open-access PCs; have access when needed	28	24	▲20	25	24
Don't own/have access when needed	1	1	2	▲4	2

---

*I.e., 9% of students in doctoral universities are provided with a PC for their sole use by their school.

▲This percentage is statistically significantly different from that for all other types of students combined ($p < .05$).

Source: Student questionnaire, questions 11 - 14.

Compared with the students' responses, Computer questionnaire respondents appear to considerably underestimate the availability of PCs to students. Only about two-thirds (64 percent) estimated that more than 90 percent of their students have access when needed to a PC (either their own or one provided by the institution) for use outside the classroom (Exhibit III-24). This percentage ranges from a low of 54 percent at public 2-year colleges to a high of 88 percent at private doctoral universities.

Exhibit III-24

PERCENTAGE OF INSTITUTIONS THAT PROVIDE STUDENTS WITH ACCESS TO A MICROCOMPUTER OR WORKSTATION (THEIR OWN OR ONE PROVIDED BY THE INSTITUTION) WHEN NEEDED FOR USE OUTSIDE THE CLASSROOM, BY TYPE OF INSTITUTION

Proportion of Students Estimated to Have Access	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
Fewer than 25%	5*	▲2	8	▲2	▲2	7	▲18	6
25% to 49%	4	▲0	5	5	▲3	▲8	7	6
50% to 74%	16	▲4	11	▲5	8	▲14	6	11
75% to 90%	12	▲6	11	13	9	15	8	12
More than 90%	61	▲88	62	▲74	▲77	▲54	61	64

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*I.e., 5% of public doctoral respondents reported that fewer than 25% of students have access to a PC when needed for use outside the classroom. Column percentages may not sum to 100 because "have no idea" responses (all less than 5%) are not shown.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 3.

Open-Access Microcomputers and Workstations

Almost all schools (96 percent) have open-access PCs available for students, located most often in computer centers (at 78 percent of schools) and libraries (77 percent). In about two-thirds of schools (63 percent), open-access PCs are located in academic departments. Of those schools that have on-campus student residences, 39 percent have open-access PCs in residences. Relatively few schools provide open-access PCs in student centers (14 percent). Among schools that have open-access PCs, most (61 percent) estimated that the ratio of students to machines is between 11 and 50 students to one machine (35 percent estimated 11 to 25 students per machine, and 26 percent estimated 26 to 50 students per machine). Seventeen percent have 10 or fewer students to one machine. Only 10 percent have more than 100 students to one machine.

Similarly, the vast majority of faculty respondents (87 percent) reported that their institution has open-access PCs that are available for their use, with no appreciable differences by type of institution.

COMPUTER-RELATED POLICIES

General Computer Policies

About half of the schools surveyed have written policies about duplication of copyrighted software (48 percent) and access to computers by faculty and/or students (47 percent) (Exhibit III-25). About a third (30 percent) have policies about computer ethics, and a fourth (25 percent) have policies regarding privacy and confidentiality issues in the use of instructional technologies. Rarely included in written policies are freedom of speech issues in the use of computers (11 percent), promotion and tenure credit for software or courseware development (7 percent), and requirements regarding the computer literacy of new or existing faculty (3 percent).

There are considerable differences by institutional type on most of these issues. Where there are appreciable differences (i.e., all issues except computer literacy), public comprehensive institutions are more likely than average to have written policies. In contrast, private 2-year schools are much less likely than other schools to have written policies.

Exhibit III-25

PERCENTAGES OF INSTITUTIONS THAT ADDRESS VARIOUS COMPUTER ISSUES IN WRITTEN POLICIES, BY TYPE OF INSTITUTION

(Listed in Descending Order of "All Institutions" Percentages)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
Duplication of copyrighted software	54*	57	▲62	56	46	45	▲22	48
Access to computers by faculty and/or students	▲57	53	▲60	▲59	51	▲38	▲30	47
Computer ethics	38	▲49	▲42	▲41	29	26	▲7	30
Privacy and confidentiality issues in the use of instructional technologies	27	▲36	▲40	32	28	▲18	▲9	25
Freedom of speech issues in the use of computers	▲22	▲26	▲17	12	13	▲5	▲0	11
Promotion and tenure credit for software/courseware development	7	▲2	▲13	10	8	5	▲0	7
Requirements regarding the computer literacy of new faculty	▲0	▲0	▲1	1	3	4	▲0	3
Requirements regarding the computer literacy of existing faculty	▲0	▲0	▲1	1	4	4	▲0	3

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*I.e., 54% of public doctoral institutions have written policies regarding duplication of copyrighted software.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: CAO questionnaire, question 2.

Computer-Related Requirements of Students

Almost no schools (2 percent) require any of their undergraduates to own or have sole use of a PC, and very few (8 percent) have any requirements regarding computer use or familiarity that undergraduate students must meet before enrollment. Six percent have computer-use requirements for some undergraduates (e.g., those intending to major in a particular discipline), and only 2 percent have such requirements for all undergraduates. Two percent and 3 percent, respectively, do not have computer skills requirements or ownership requirements now but plan to do so within the next 3 years. There are no appreciable differences by institutional type regarding computer-use requirements, but doctoral institutions are more likely than others to have computer-ownership policies. Seven percent of public doctoral universities and 10 percent of private doctorals require PC ownership of at least some undergraduates.

Considerably more institutions have computer use requirements that undergraduates must meet **before graduation**. Overall, 57 percent have some such requirements—32 percent have them for all undergraduates, and 25 percent have them for some undergraduates (Exhibit III-26). Another 6 percent plan to implement computer-use requirements in the next 3 years.

Exhibit III-26

INSTITUTIONS THAT HAVE REQUIREMENTS REGARDING COMPUTER USE OR FAMILIARITY THAT UNDERGRADUATE STUDENTS MUST MEET BEFORE GRADUATION, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Have computer-use requirements for **all** undergraduates	▲20*	▲23	▲43	34	37	▲26	38	32
Have computer-use requirements for **some** undergraduates	▲33	27	28	28	▲15	28	24	25
Have **no** computer-use requirements for undergraduates	▲45	▲48	▲26	31	▲43	36	32	36
Have no current requirements, but plan to do so within the next 3 years	▲1	▲2	▲3	6	4	▲10	6	6

---

*I.e., 20% of public doctoral respondents reported that their institution has requirements regarding computer use or familiarity that all undergraduates must meet before graduation.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: CAO questionnaire, question 5.

Computer-Use Charge Policies

Across all types of institutions, only 10 percent of institutions that have mainframes to which faculty have access charge faculty for mainframe use (Exhibit III-27). However, there are large differences by type of institution. Those that do charge, which are mostly the doctoral universities, are most likely to charge for funded research. For example 41 percent of public doctoral universities and 32 percent of private doctoral universities charge for some kind of faculty use of mainframes. At public doctoral universities, all faculty who are charged at all are charged for funded research. At private doctoral universities, 30 percent are charged for funded research.

Fewer schools, even among the doctoral group, charge for use of PCs. Overall, only 6 percent charge any faculty for PC use. This percentage ranges from 2 percent of the liberal arts schools to 28 percent of public doctoral universities. As with mainframe use, the type of use most likely to be charged is funded research.

Exhibit III-27

TYPES OF COMPUTER USE FOR WHICH FACULTY ARE CHARGED, BY TYPE OF INSTITUTION

(Includes Only Those Institutions Whose Faculty Have Access to Each Type of Computer)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
Use of supercomputers, mainframes, or minis								
Funded research	▲41*	▲30	▲15	3	▲3	▲0	—	6
Non-funded research	▲7	▲18	3	1	▲0	▲0	—	2
Instruction	▲5	▲7	1	0	0	1	—	1
Personal use	▲16	▲9	2	▲0	3	▲1	—	2
Any of the above	▲41	▲32	▲16	7	9	▲4	—	10
Use of microcomputers or workstations								
Funded research	▲12	▲12	5	1	2	▲1	—	3
Non-funded research	3	▲8	3	2	1	0	—	1
Instruction	1	▲8	2	1	1	1	—	1
Personal use	▲7	4	5	1	2	1	—	2
Any of the above	▲28	▲19	9	3	▲2	▲4	—	6

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*I.e., 41% of public doctoral institutions whose faculty have access to the institution's mainframe(s) charge faculty for use of the mainframe to conduct funded research .

▲This percentage is statistically significantly different from that for all other types of schools combined (p < .05).

—Too few respondents to provide a reliable estimate.

Source: Computer questionnaire, question 6.

Students are considerably more likely than faculty to be charged for using institutional computers—both mainframes and PCs—and the institutional-type patterns for student computer-use charges are quite different from the patterns of faculty computer-use charges. Overall, 38 percent of institutions that allow students access to mainframes charge for their use, ranging from a low of 11 percent of private doctoral universities to a high of 42 percent of public 2-year schools (Exhibit III-28). Percentages of schools that charge for PC use are very similar. At the public doctoral and comprehensive schools, computer use charges are most likely to be included in student fees, whereas at public 2-year colleges, they are most likely to be included in fees for specific courses.

Exhibit III-28

INSTITUTIONAL CHARGE POLICIES REGARDING STUDENT COMPUTER USE, BY TYPE OF INSTITUTION

(Includes Only Those Institutions Whose Students Have Access to Each Type of Computer)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Charges for use of supercomputers, mainframes, or minis								
Included in student fees	▲28*	16	▲34	20	27	▲12	▲0	19
Included in specific course fees	▲5	▲7	13	12	18	▲27	▲18	19
By length and/or type of use (hourly charges, printing charges, etc.)	▲14	4	1	2	4	▲0	▲0	2
Made against fixed-dollar-amount accounts established by students	▲5	2	1	0	1	1	0	1
Other charging mechanism	5	4	3	2	1	2	▲0	2
Any charges (other than through tuition)	36	▲11	40	▲28	40	42	41	38
Charges for use of micro-computers/workstations								
Included in student fees	▲36	▲14	▲45	25	23	▲16	▲17	24
Included in specific course fees	24	▲6	▲19	28	27	27	24	25
By length and/or type of use (hourly charges, printing charges, etc.)	▲17	▲0	4	2	4	▲1	1	3
Made against fixed-dollar-amount accounts established by students	▲5	4	1	0	1	1	0	1
Other charging mechanism	7	4	4	3	4	3	2	4
Any charges (other than through tuition)	40	▲14	▲52	37	42	36	34	39

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*I.e., 28% of public doctoral institutions whose students have access to the institution's mainframe(s) charge students for use of the mainframe through charges included in student fees .

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 5.

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Patterns of institutional charge policies with regard to faculty and student use of software parallel policies on computer hardware use. Overall, 11 percent of institutions do not provide any software for faculty or for students. Of those who do, 7 percent charge faculty for software use (for example, software that was developed internally or for which the institution has a site license), and 6 percent charge students.

Institutional Leadership in the Purchase and Distribution of PCs

According to CAO respondents, leadership or direction at their institution in the acquisition and distribution of PCs is most often provided by academic computing staff (68 percent) and by academic administrators, such as Deans (67 percent). Individual faculty and individual academic departments provide leadership or direction at 44 percent of institutions. Other groups listed—library staff, media resources staff, and other groups—provide leadership in this area at fewer than 15 percent of institutions.

- **Academic computing staff** are especially likely to provide leadership in this area at the private doctorals (85 percent), private comprehensives (81 percent), and public doctorals (78 percent); they are least likely to provide leadership at private 2-year schools (48 percent).
- **Academic administrators** are most likely to provide leadership at private 2-year and public doctoral institutions (both 79 percent); they are least likely to provide leadership at private comprehensive (58 percent) and liberal arts schools (54 percent).
- **Individual faculty and academic departments** are most likely to provide leadership at the public doctorals (62 percent) and private doctorals (60 percent); they are least likely to provide leadership at the private comprehensives (32 percent).

PERCEIVED BENEFITS OF COMPUTERS AND OTHER INSTRUCTIONAL TECHNOLOGIES

Faculty and CAO respondents were asked about the extent to which they think computers and other instructional technologies have benefited various aspects of education and faculty productivity. In general, respondents tend to believe that there has been considerable benefit, but there are notable differences between the two sets of respondents and among those in the various types of institutions.

Of the various benefit items asked of CAO respondents, "the quality of undergraduate education at your institution" was given the highest ratings (Exhibit III-29). Forty-three percent of the respondents rated the benefit received as "a great deal," and another 50 percent indicated that "a moderate amount" of benefit has been received. Across types of institutions, the CAO mean ratings range from 3.2 (on a 4-point scale) at liberal arts colleges to 3.5 at private comprehensive and private 2-year schools (Exhibit III-30). Two similar questions asked of faculty were about "the quality of education in general at your institution" and "the quality of education that you provide to undergraduates." In both cases, faculty ratings are slightly lower than the CAO ratings (Exhibit III-31). For example, with regard to "education in general," 41 percent of faculty selected "a great deal," and 40 percent selected "a moderate amount." Differences by institutional type among the faculty on these two items are small (Exhibit III-32).

Mean ratings for the other CAO benefit items are quite similar to one another, varying by only 0.2 points—from 3.1 for "the quality of graduate education at your institution" (only those schools that provide graduate education) to 2.9 for "faculty productivity as teachers" and "faculty productivity as scholars/researchers." "The way faculty at your institution teach their classes" received a mean rating of 3.0. Across institutional types, by far the largest differences relate to faculty productivity as scholars or researchers, with mean ratings ranging from 2.6 at the 2-year schools (where faculty tend not to be involved in research) to 3.6 at the doctoral universities (where faculty tend to do extensive research).

The faculty themselves gave higher ratings than did CAO respondents to their productivity as scholars/researchers (faculty mean = 3.3; CAO mean = 2.9), but this difference is due largely to the fact that the faculty sample is dominated by those in doctoral institutions. Within each type of school, the faculty and CAO means are very close for both the doctoral and comprehensive groups.

Benefits that technology has provided in accessing information resources and in contacts with colleagues vary substantially by type of institution, reflecting previously noted differences in access to networks. For example, the mean rating on access to information resources by faculty at public 2-year schools is 2.6, compared with 3.0 for those at comprehensive schools and 3.2 for those at doctoral schools.

Of all the aspects of academic life covered in these items, faculty perceive that their contacts with students have benefited the least from technology. Only 10 percent believe that there has been a great deal of benefit, and 19 percent rated the benefit as "moderate." The mean rating on this item is 2.0, with no appreciable differences by type of institution.

Tabulations of the faculty responses to these questions by program area found that, in general, education faculty tended to give relatively high ratings, especially with regard to "the materials you use for your classes" (education mean = 3.4). Natural sciences and CSME faculty gave relatively high ratings to "contact with colleagues at other institutions" (natural sciences mean = 2.8; CSME mean = 2.7). There were few relatively low ratings.

Exhibit III-29

EXTENT TO WHICH COMPUTERS AND OTHER INSTRUCTIONAL TECHNOLOGIES HAVE BENEFITED ASPECTS OF THE INSTITUTION

(Listed in Descending Order of Mean Rating)

	Mean Rating	Not At All	Not Very Much	A Moderate Amount	A Great Deal
The quality of **undergraduate** education at your institution	3.4	<1[*]	7	50	43
The quality of **graduate** education at your institution[a]	3.1	1	18	47	32
The way faculty at your institution teach their classes	3.0	< 1	18	60	20
Faculty productivity as scholars/researchers	2.9	5	23	40	28
Faculty productivity as teachers	2.9	2	23	54	18

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very much, 3 = a moderate amount, and 4 = a great deal. Item percentages may not sum to 100 because "have no idea" responses (all less than 5%) are not shown.

[*] I.e., fewer than 1% of respondents reported that computers/other instructional technologies do not provide any benefit at all to the quality of undergraduate education at their institution.

[a] This question was relevant to only some of the respondents.

Source: CAO questionnaire, question 25.

Exhibit III-30

EXTENT TO WHICH COMPUTERS AND OTHER INSTRUCTIONAL TECHNOLOGIES HAVE BENEFITED ASPECTS OF THE INSTITUTION, BY TYPE OF INSTITUTION

(Listed in Descending Order of the "All Institutions" Mean Rating)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
The quality of **undergraduate** education at your institution	3.3	3.3	3.4	▴3.5	▴3.2	3.4	▴3.5	3.4
The quality of **graduate** education at your institution[a]	▴3.4	▴3.4	3.2	3.1	▴2.9	n.a.	n.a.	3.1
The way faculty at your institution teach their classes	▴2.8	▴2.8	3.0	3.0	▴2.9	▴3.1	3.1	3.0
Faculty productivity as scholars or researchers	▴3.6	▴3.6	▴3.2	▴3.2	3.0	▴2.6	▴2.6	2.9
Faculty productivity as teachers	2.9	▴2.7	2.9	3.0	▴2.8	2.9	3.0	2.9

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very much, 3 = a moderate amount, and 4 = a great deal.

▴This mean is statistically significantly different from that for all other types of schools combined ($p < .05$).

[a] This question was relevant to only some of the respondents.

Source: CAO questionnaire, question 25.

Exhibit III-31

EXTENT TO WHICH COMPUTERS AND OTHER INSTRUCTIONAL TECHNOLOGIES HAVE BENEFITED FACULTY

(Listed in Descending Order of Mean Rating)

	Mean Rating	Not At All	Not Very Much	A Moderate Amount	A Great Deal	Have No Idea
The quality of education in general at your institution	3.3	1*	10	40	41	8
Your productivity as a scholar/researcher	3.3	8	10	22	58	2
Your productivity as a teacher	3.2	6	13	31	48	2
The quality of education that you provide to **graduate** students[a]	3.2	12	9	30	47	3
The quality of education that you provide to **undergraduates**[a]	3.1	8	12	37	40	2
The materials you use for your classes	3.1	8	16	34	41	1
Your access to information resources	3.0	13	14	29	41	2
Your contacts with colleagues at other institutions	2.4	32	19	17	28	4
Your contacts with colleagues at your institution	2.4	28	25	21	22	4
Your contacts with your students	2.0	42	25	19	10	3

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very much, 3 = a moderate amount, and 4 = a great deal.

*I.e., 1% of respondents reported that computers and other instructional technologies do not provide any benefit at all to the quality of education in general at their institution.

[a] This question was relevant to only some of the respondents.

Source: Faculty questionnaire, question 27.

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Exhibit III-32

EXTENT TO WHICH COMPUTERS AND OTHER INSTRUCTIONAL TECHNOLOGIES HAVE BENEFITED FACULTY, BY TYPE OF INSTITUTION

(Listed in Descending Order of the "All Faculty" Mean Rating)

	Doctoral	Comprehensive	Public 2-Year	All Faculty[a]
The quality of education **in general** at your institution	3.3	3.3	3.4	3.3
Your productivity as a scholar or researcher	▲3.7	3.3	▲2.9	3.3
Your productivity as a teacher	3.2	3.2	3.3	3.2
The quality of education that **you** provide to **graduate** students[b]	3.2	3.1	n.a.	3.2
The quality of education that **you** provide to **undergraduates**[b]	▲3.0	3.1	▲3.2	3.1
The materials you use for your classes	▲3.0	3.1	▲3.3	3.1
Your access to information resources	▲3.2	3.0	▲2.6	3.0
Your contacts with colleagues at **other** institutions	▲2.9	▲2.2	▲1.8	2.4
Your contacts with colleagues at **your** institution	▲2.7	▲2.2	▲2.1	2.4
Your contacts with your students	2.0	1.9	1.9	2.0

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very much, 3 = a moderate amount, and 4 = a great deal.

▲This mean is statistically significantly different from that for all other types of faculty combined ($p < .05$).

[a] Includes faculty in liberal arts colleges, which comprise too small a sample to report separately.

[b] This question was relevant to only some of the respondents.

Source: Faculty questionnaire, question 27.

COMPUTER-RELATED ACCOMPLISHMENTS

CAO, Computer questionnaire, faculty, and student respondents were asked their perceptions about various computer-related accomplishments by their school. Overall, the perceptions are moderately favorable, and there is a considerable degree of consensus, both among the several sets of respondents and across institutional types. (Among faculty and students, there are no important differences by institutional type.) Exhibits III-33 through III-36 below summarize the CAO, faculty, and student responses on these issues. Computer questionnaire responses are not presented because they are very similar to those provided by the CAO respondents.

Of the various issues covered, the only one on which at least half of both CAO and faculty respondents believe that their school has done "moderately well" or "very well" is in meeting student needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom. About three-fourths of the CAO respondents (73 percent) and about half of the faculty (53 percent) indicated that their school has done moderately or very well in meeting these student needs. Students gave their schools even higher ratings—8 in 10 (84 percent) think their school has done moderately or very well on this issue.

The CAO and faculty ratings both are slightly less favorable with regard to how well the school has met faculty needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom. Six in 10 CAO respondents (62 percent) and slightly fewer than half of the faculty (44 percent) think their school has done moderately or very well on this dimension.

Six in 10 CAO respondents (61 percent) and slightly fewer than half of the faculty (43 percent) also think their school has done moderately or very well in using instructional technologies to improve the overall quality of education at their institution.[5] On a similar question, students are again more positive than CAO and faculty respondents. They were asked to what extent they think computers and audio, video, and multimedia technologies have improved the overall quality of the education that they have received. Eighty-one percent said "a moderate amount" or "a great deal."

About half of the CAO respondents (54 percent) think their institution has done a moderately or very good job addressing issues of confidentiality and privacy related to technology use (computers, databases, and networks). Considerably fewer faculty (28 percent) gave these ratings, but the difference is due mostly to the large group of faculty (29 percent) who said they had no idea about this issue. This is the only "accomplishment" issue on which there are large differences by type of institution. The mean ratings range from a low of 2.5 at liberal arts and public 2-year schools to a high of 3.1 at private doctoral universities.

Substantially the lowest ratings by both CAO respondents and faculty are given to how well the institution has provided incentives and rewards to faculty for integrating instructional technology into the classroom. Only 23 percent of CAO respondents and 14 percent of faculty gave their school a moderate or very good rating on this item.

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[5] Library questionnaire respondents also were asked this question. Their responses are very similar to those of the CAO respondents.

Exhibit III-33

CAO RESPONDENTS' PERCEPTIONS OF THEIR INSTITUTION'S COMPUTER-RELATED ACCOMPLISHMENTS

(Listed In Descending Order of Mean Ratings)

	Mean Rating	Not at All	Not Very Well	Moderately Well	Very Well
Met **student** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	2.9	1*	26	57	16
Met **faculty** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	2.7	2	36	52	10
Used instructional technologies to improve the overall quality of education at your institution	2.7	2	36	55	6
Addressed issues of confidentiality and privacy related to technology use (computers, databases, and networks)	2.6	12	31	38	16
Developed clear plans for the use of instructional technology	2.5	7	40	45	8
Provided incentives and rewards to faculty for integrating instructional technology into the classroom	2.0	24	52	20	3

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very well, 3 = moderately well, and 4 = very well. Item percentages may not sum to 100 because "have no idea" responses (all less than 5%) are not shown.

*I.e., 1% of respondents reported that, in their opinion, their institution had "not at all" met student needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom.

Source: CAO questionnaire, question 27.

Exhibit III-34

CAO RESPONDENTS' MEAN RATINGS OF PERCEIVED INSTITUTIONAL COMPUTER-RELATED ACCOMPLISHMENTS, BY TYPE OF INSTITUTION

(Listed in Descending Order of "All Institutions" Mean Ratings)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Met **student** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	▲2.7	3.0	2.9	2.9	2.8	2.9	▲3.0	2.9
Met **faculty** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	2.6	2.7	2.7	▲2.8	2.6	2.7	2.7	2.7
Used instructional technologies to improve the overall quality of education at your institution	2.6	2.8	2.6	2.8	▲2.5	▲2.8	2.7	2.7
Addressed issues of confidentiality and privacy related to technology use (computers, databases, and networks)	▲2.8	▲3.1	▲2.8	2.7	2.5	2.5	2.6	2.6
Developed clear plans for the use of instructional technology	2.6	2.6	▲2.7	2.6	▲2.4	2.5	2.6	2.5
Provided incentives and rewards to faculty for integrating instructional technology into the classroom	2.1	2.0	2.1	2.0	2.0	2.0	▲1.9	2.0

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very well, 3 = moderately well, and 4 = very well.

▲This mean is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: CAO questionnaire, question 27.

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Exhibit III-35

FACULTY PERCEPTIONS OF INSTITUTION'S COMPUTER-RELATED ACCOMPLISHMENTS

(Listed in Descending Order of Mean Ratings)

	Mean Rating	Not At All	Not Very Well	Moderately Well	Very Well	Have No Idea
Met **student** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	2.7	4*	34	41	12	9
Met **faculty** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	2.5	8	44	34	10	4
Developed clear plans for the use of instructional technology	2.4	11	40	30	10	8
Used instructional technologies to improve the overall quality of education	2.4	8	41	35	8	8
Addressed issues of confidentiality and privacy related to technology use (computers, databases, and networks)	2.2	20	23	20	8	29
Provided incentives and rewards to faculty for integrating instructional technology into the classroom	1.8	38	39	12	2	9

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very well, 3 = moderately well, and 4 = very well.

*I.e., 4% of faculty respondents reported that, in their opinion, their institution had not at all met student needs regarding equipment, technical support, and training.

Source: Faculty questionnaire, question 30.

Exhibit III-36

STUDENT PERCEPTIONS OF INSTITUTION'S COMPUTER-RELATED ACCOMPLISHMENTS

	Mean Rating	Not At All	Not Very Well/Much	Moderately Well/ A Moderate Amount	Very Well/ A Great Deal
How well school has met **student** needs regarding equipment, technical support, and training to use computers and audio, video, and multimedia technologies	3.2	3*	14	47	37
To what extent computers and audio, video, and multimedia technologies have improved the overall quality of education that respondent has received	3.2	6	13	39	42

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very well/much, 3 = moderately well/a moderate amount, and 4 = very well/a great deal.

*I.e., 3% of students reported that, in their opinion, their institution had not at all met student needs regarding equipment, technical support, and training.

Source: Student questionnaire, questions 64 and 65.

BARRIERS TO INCREASED USE OF COMPUTERS FOR INSTRUCTIONAL PURPOSES

Respondents' perceptions of impediments, or barriers, to increased use of computers for instructional purposes were obtained in the CAO and Computer questionnaires (with regard to the institution's use of computers) and in the faculty and student questionnaires (with regard to the respondent's own use of computers/instructional technologies). In all questionnaires, the response categories comprised a 4-point scale, where 1 = not an impediment,[6] 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment. (A "have no idea" option also was provided.) Many of the items were the same in all questionnaires, but some were specific to each type of respondent. The next eight exhibits present the overall percentages and mean ratings by type of institution for CAO respondents (Exhibits III-37 and III-38), Computer questionnaire respondents (Exhibits III-39 and III-40), faculty (Exhibits III-41 and III-42), and students (Exhibits III-43 and III-44).

Major findings include:

- **Insufficient funds** (or, for the students, the expense of computers and computer accessories) are perceived as the most significant barrier for all four sets of respondents (and in all types of institutions), and especially so for the institutional respondents. The overall mean ratings on this item were 3.6 for the CAO respondents, 3.4 for the Computer questionnaire respondents, 3.1 for the faculty, and 2.7 for the students.
- Another money-related issue—**lack of appropriate equipment, software, or hardware**—is the second or fourth most significant barrier for all four sets of respondents, with mean ratings from 2.5 (for students) to 2.9 (for faculty).
- Among the two sets of institutional respondents, **lack of staff who can provide training** also is relatively important (means = 2.7 and 2.8), and among faculty, the **amount of time required to learn** is similarly important (mean = 2.8). The latter is a less significant barrier for students, whose mean rating on this item is only 2.1. (By way of further comparison between the faculty and student ratings on this item, 30 percent of faculty rated this as a major barrier, compared with 12 percent of students.)
- **Lack of incentives/rewards to faculty** for instructional uses of computers/instructional technologies is perceived as moderately important (means = 2.5 and 2.6) by faculty as well as the two sets of institutional respondents.
- **Lack of interest** "on my part" is perceived as considerably less of a barrier among faculty (mean = 1.7) than **lack of interest among faculty** is among the two sets of institutional respondents (means = 2.2 and 2.3). Students also rate their own lack of interest as quite unimportant (mean = 1.8).
- **Inadequate faculty technical/computer skills** is perceived to be a considerably larger barrier than is **inadequate student skills** (means = 2.6 vs. 2.2)
- Even though lack of incentives/rewards to faculty is a moderately important barrier, **lack of top administrators' interest in expanded use of instructional technologies/computers** is seen as relatively unimportant, especially by the CAO respondents. (One might think that administrators' interest would be reflected in the institution's incentive and reward system.) (CAO mean rating = 1.6; Computer respondent and faculty means = 2.0.)

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[6] In the student interviews, the term "barrier" was used instead of "impediment."

- Among the two sets of respondents who were asked about them (the CAO and faculty groups) **copyright issues** are perceived as only a minor barrier, especially by the CAO respondents. (Mean for faculty = 2.0; mean for CAO respondents = 1.7.)

For each set of respondents, the following institutional-type patterns emerged:

Among **CAO respondents,** those in private doctoral universities and private 2-year colleges gave consistently low ratings. Private doctoral means are lower than average on 13 of the 17 items, and private 2-year means are lower than average on 9 items. In contrast, significantly higher-than-average ratings are rare. Only one type of school (public comprehensive) has even three above-average ratings.

The items on the CAO questionnaire that produced the largest differences among the seven types of institutions are:

- Inadequate student technical/computer skills: 1.6 (private doctoral) to 2.3 (private comprehensive).
- Lack of infrastructure (e.g., cabling): 2.1 (private doctoral) to 2.7 (liberal arts).
- Lack of space: 2.2 (private doctoral) to 2.8 (public doctoral, public comprehensive and public 2-year).
- Copyright issues: 1.4 (private comprehensive) to 2.0 (public doctoral).

Computer questionnaire responses show no consistent patterns of differences by institutional type. Almost all types of schools have at least one higher-than-average rating and at least one lower than average rating. (Note, however, that there are not enough private 2-year-school respondents to this question to include as a separate group.)

Differences among the mean ratings provided by the various types of institutions tend to be smaller than the CAO differences. On the Computer questionnaire, the largest differences are on the following items:

- Lack of appropriate hardware: 2.1 (private doctoral) to 2.8 (public 2-year).
- Lack of incentives/rewards to faculty: 2.5 (liberal arts and public 2-year) to 3.1 (public and private doctoral).
- Insufficient funds: 3.0 (private doctoral) to 3.5 (public doctoral and public 2-year).
- Lack of space: 2.5 (public comprehensive) to 3.0 (public doctoral).

Among **faculty** respondents, there are no appreciable differences by institutional type on 8 of the 17 items asked. However, on the items where there are differences, faculty at doctoral institutions tend to give relatively low ratings and those at public 2-year colleges tend to give relatively high ratings. Items that produce the largest differences are:

- Insufficient institutional/departmental funds: 2.9 (doctoral) to 3.5 (public 2-year).
- Lack of space: 2.2 (doctoral) to 2.7 (public 2-year).
- Lack of equipment: 2.8 (doctoral) to 3.2 (public 2-year).
- Lack of infrastructure (cabling, power outlets, etc.): 2.3 (doctoral) to 2.7 (public 2-year).

The single item on which doctoral school ratings are relatively low is "lack of interest on my part." Here the mean rating for doctoral school faculty is 1.8, compared with means of 1.6 and 1.5 for comprehensive and public 2-year-school faculty, respectively.

Differences in faculty responses by their academic and demographic characteristics include the following:

- **Program area:** Business faculty are more likely than others to think that lack of incentives/rewards is an impediment (mean = 2.8). CSME faculty are less likely than others to think that the following are impediments: time required to learn, lack of knowledge about how to apply instructional technologies, lack of information about the availability of instructional software, and lack of appropriate instructional software.
- **Age:** Faculty age 60 or older are considerably less likely than their younger counterparts to think that lack of funds is an impediment (mean ratings: 2.6 for those age 60+, compared with 3.1 and 3.2 for the three younger age groups). However, they are considerably more likely to think that lack of their own interest is an impediment (2.0 vs. 1.6 and 1.7).
- **Race/ethnicity:** Targeted minorities are more likely than Asians and whites to think that lack of top administrator interest in an impediment (2.3 vs. 1.9). However, they are less likely to think that their own lack of interest or the time required to learn is an impediment. Mean ratings for lack of interest are 1.4 for targeted minorities and 1.7 for Asians and whites; means for time required to learn are 2.4 for targeted minorities and 2.8 for Asians and whites.
- **Other characteristics:** There are no appreciable differences on any of these items by academic rank (among faculty in 4-year schools), tenure status, or gender.

Student differences across institutional types tend to be relatively small—the range of means is no larger than 0.3 on any of the items. What differences do exist show that students in comprehensive schools tend to give relatively low ratings. There also are few appreciable differences by academic and demographic characteristics in students' responses to these questions.

Exhibit III-37

CAO RESPONDENTS' PERCEPTIONS OF IMPEDIMENTS TO THE INSTITUTION'S INCREASED USE OF COMPUTERS FOR INSTRUCTIONAL PURPOSES

(Listed in Descending Order of Mean Ratings)

	Mean Rating	Not an Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
Insufficient funds	3.6	1*	8	24	66	< 1
Lack of appropriate equipment	2.9	9	23	36	32	< 1
Lack of space	2.7	15	27	32	25	1
Lack of staff who can provide training in instructional technologies	2.7	14	27	32	27	< 1
Inadequate faculty technical/ computer skills	2.6	5	39	40	15	1
Lack of infrastructure (e.g., cabling)	2.6	20	26	30	23	1
Lack of skilled technical staff	2.6	17	29	31	22	< 1
Lack of incentives/rewards to faculty for using instructional technologies	2.5	14	32	34	16	4
Lack of appropriate instructional software	2.4	18	36	29	15	2
Faculty technophobia	2.4	12	47	31	9	1
Lack of faculty interest in expanded use of instructional technologies	2.3	21	40	31	8	< 1
Lack of strategic planning	2.2	31	30	25	14	1
Inadequate student technical/ computer skills	2.2	19	51	25	4	1
Lack of appropriate organizational structures	2.1	38	29	22	11	1
Student technophobia	1.8	37	45	14	2	2
Copyright issues	1.7	47	24	11	5	13
Lack of top administrators' interest in expanded use of instructional technologies	1.6	66	16	13	5	1

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

*I.e., 1% of respondents reported that insufficient funds are not an impediment to their institution's increased used of computers for instructional purposes.

Source: CAO questionnaire, question 26.

Exhibit III-38

MEAN RATINGS, CAO RESPONDENTS' PERCEPTIONS OF IMPEDIMENTS TO THE INSTITUTION'S INCREASED USE OF COMPUTERS FOR INSTRUCTIONAL PURPOSES, BY TYPE OF INSTITUTION

(Listed in Descending Order of "All Institutions" Mean Ratings)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Insufficient funds	3.6	•3.3	•3.7	3.5	3.5	3.6	•3.4	3.6
Lack of appropriate equipment	•2.8	•2.6	3.0	2.9	3.0	3.0	•2.8	2.9
Lack of space	2.8	•2.2	2.8	2.6	2.6	2.8	2.6	2.7
Lack of staff who can provide training in instructional technologies	2.8	•2.4	2.8	2.6	2.8	2.7	•2.5	2.7
Inadequate faculty technical/ computer skills	2.7	•2.4	2.7	2.7	2.7	2.6	•2.5	2.6
Lack of infrastructure (e.g., cabling)	2.4	•2.1	2.5	2.5	2.7	2.6	2.5	2.6
Lack of skilled technical staff	2.6	•2.2	2.6	•2.3	2.6	•2.7	2.5	2.6
Lack of incentives/rewards to faculty for using instructional technologies	2.6	2.6	•2.7	2.6	•2.4	•2.6	•2.2	2.5
Lack of appropriate instructional software	2.4	•2.2	2.3	2.5	2.5	2.4	2.3	2.4
Faculty technophobia	2.4	•2.1	•2.5	2.4	2.4	2.4	•2.2	2.4
Lack of faculty interest in expanded use of instructional technologies	2.4	2.1	2.3	2.3	2.2	2.3	•1.9	2.3
Lack of strategic planning	2.2	•1.9	2.1	2.2	2.3	2.2	2.1	2.2
Inadequate student technical/ computer skills	•1.9	•1.6	2.1	•2.3	2.2	2.2	2.2	2.2
Lack of appropriate organizational structures	2.1	•1.8	2.0	2.0	•2.3	2.0	•1.8	2.1
Student technophobia	•1.6	•1.4	1.8	1.9	1.8	1.8	1.9	1.8
Copyright issues	•2.0	1.8	1.7	•1.4	•1.5	•1.8	1.6	1.7
Lack of top administrators' interest in expanded use of instructional technologies	1.6	1.6	1.5	1.6	1.6	1.5	•1.4	1.6

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

•This mean is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: CAO questionnaire, question 26.

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Exhibit III-39

COMPUTER QUESTIONNAIRE RESPONDENTS' PERCEPTIONS OF IMPEDIMENTS TO THE INSTITUTION'S INCREASED USE OF COMPUTERS FOR INSTRUCTIONAL PURPOSES

(Listed in Descending Order of Mean Ratings)

	Mean Rating	Not an Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment
Insufficient funds	3.4	4*	10	26	59
Lack of staff who can provide training in instructional uses of computers	2.8	13	25	33	29
Inadequate faculty computer skills	2.7	6	36	41	16
Lack of appropriate hardware	2.6	18	25	32	24
Lack of incentives/rewards to faculty for instructional uses of computers	2.6	16	28	28	25
Lack of space	2.6	17	29	27	27
Lack of strategic planning	2.4	24	32	25	20
Inadequate infrastructure (e.g., cabling, power outlets, etc.)	2.4	26	33	20	21
Faculty technophobia	2.4	15	45	28	12
Lack of appropriate organizational structures	2.3	28	31	24	15
Lack of appropriate instructional software	2.3	24	35	28	13
Lack of faculty interest in expanded instructional uses of computers	2.2	29	31	27	12
Lack of common user interfaces	2.1	28	40	21	7
Inadequate student computer skills	2.1	22	50	24	3
Lack of top administrators' interest in expanded instructional uses of computers	2.0	44	23	19	13
Student technophobia	1.8	42	40	16	1

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment. Item percentages may not sum to 100 because "have no idea" responses (all less than 5%) are not shown.

*I.e., 4% of respondents reported that insufficient funds are not an impediment to their institution's increased used of computers for instructional purposes.

Source: Computer questionnaire, question 48.

Exhibit III-40

MEAN RATINGS, COMPUTER QUESTIONNAIRE RESPONDENTS' PERCEPTIONS OF IMPEDIMENTS TO THE INSTITUTION'S INCREASED USE OF COMPUTERS FOR INSTRUCTIONAL PURPOSES, BY TYPE OF INSTITUTION

(Listed in Descending Order of "All Institutions" Mean Ratings)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Insufficient funds	3.5	▴3.0	3.4	▴3.2	3.4	▴3.5	—	3.4
Lack of staff who can provide training in instructional uses of computers	2.7	2.7	▴3.0	▴3.0	▴2.9	▴2.6	—	2.8
Inadequate faculty computer skills	2.5	2.7	2.6	2.6	2.7	2.7	—	2.7
Lack of appropriate hardware	▴2.3	▴2.1	2.6	2.5	2.6	▴2.8	—	2.6
Lack of incentives/rewards to faculty for instructional uses of computers	▴3.1	▴3.1	2.7	▴2.8	2.5	2.5	—	2.6
Lack of space	▴3.0	2.8	2.5	2.6	2.6	2.7	—	2.6
Lack of strategic planning	2.4	2.2	2.3	▴2.2	▴2.6	2.4	—	2.4
Inadequate infrastructure (e.g., cabling, power outlets, etc.)	▴2.2	▴2.0	2.4	▴2.1	2.3	▴2.5	—	2.4
Faculty technophobia	2.3	2.4	2.3	2.3	2.4	2.4	—	2.4
Lack of appropriate organizational structures	2.3	2.2	2.2	2.1	2.4	2.3	—	2.3
Lack of appropriate instructional software	▴2.5	2.3	2.3	2.3	2.4	2.2	—	2.3
Lack of faculty interest in expanded instructional uses of computers	▴2.4	▴2.5	2.3	2.3	2.2	2.2	—	2.2
Lack of common user interfaces	2.1	2.0	2.1	2.1	2.1	2.1	—	2.1
Inadequate student computer skills	▴1.9	▴1.9	▴1.9	2.0	2.2	2.1	—	2.1
Lack of top administrators' interest in expanded instructional uses of computers	2.0	2.2	2.0	2.2	2.0	2.0	—	2.0
Student technophobia	▴1.6	1.7	1.7	1.7	1.8	1.8	—	1.8

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

▴This mean is statistically significantly different from that for all other types of schools combined ($p < .05$).

—Too few respondents to provide a reliable estimate.

Source: Computer questionnaire, question 48.

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Exhibit III-41

FACULTY PERCEPTIONS OF IMPEDIMENTS TO THEIR OWN INCREASED USE OF INSTRUCTIONAL TECHNOLOGIES (COMPUTERS, AUDIO, VIDEO, MULTIMEDIA), BY TYPE OF INSTITUTION

(Listed in Descending Order of Mean Ratings)

	Mean Rating	Not an Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
Insufficient institutional/department funds	3.1	12*	12	24	47	4
Lack of appropriate equipment	2.9	16	16	23	41	3
Amount of time required to learn how to use instructional technologies	2.8	14	25	30	30	1
Lack of appropriate instructional software for my courses	2.6	21	19	24	23	12
Lack of knowledge about how to apply instructional technologies in teaching my courses	2.5	20	29	30	20	2
Lack of information about the availability of appropriate instructional software for my courses	2.5	22	29	26	20	3
Lack of institutional/departmental incentives/rewards for using instructional technologies	2.5	28	20	22	24	6
Lack of staff who can provide training in instructional technologies	2.5	23	22	26	25	4
Lack of infrastructure (cabling, power outlets, etc.)	2.5	27	19	19	25	10
Lack of space	2.4	30	20	20	24	6
Lack of interest by top administrators at this institution	2.0	41	20	16	12	12
Inadequate student technical/computer skills	2.0	30	35	20	7	8
Copyright issues	2.0	35	17	14	9	25
Lack of interest on my part	1.7	60	19	14	6	1
Student technophobia	1.7	44	30	12	3	11
Lack of interest by my department/ division chairperson	1.6	63	15	8	9	5
Lack of interest by students	1.5	57	21	10	2	10

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

*I.e., 12% of respondents reported that insufficient funds are not an impediment to their increased use of instructional technologies.

Source: Faculty questionnaire, question 28.

Exhibit III-42

MEAN RATINGS, FACULTY PERCEPTIONS OF IMPEDIMENTS TO THEIR OWN INCREASED USE OF INSTRUCTIONAL TECHNOLOGIES (COMPUTERS, AUDIO, VIDEO, MULTIMEDIA), BY TYPE OF INSTITUTION

(Listed in Descending Order of Mean Ratings)

	Doctoral	Comprehensive	Public 2-Year	All Faculty
Insufficient institutional/department funds	▲2.9	3.2	▲3.5	3.1
Lack of appropriate equipment	▲2.8	3.0	▲3.2	2.9
Amount of time required to learn how to use instructional technologies	2.8	2.7	2.8	2.8
Lack of appropriate instructional software for my courses	2.6	2.6	2.5	2.6
Lack of knowledge about how to apply instructional technologies in teaching my courses	2.6	2.5	2.5	2.5
Lack of information about the availability of appropriate instructional software for my courses	2.5	2.5	2.4	2.5
Lack of institutional/departmental incentives/rewards for using instructional technologies	▲2.3	2.5	2.6	2.5
Lack of staff who can provide training in instructional technologies	2.5	2.6	2.6	2.5
Lack of infrastructure (cabling, power outlets, etc.)	▲2.3	2.6	▲2.7	2.5
Lack of space	▲2.2	2.5	▲2.7	2.4
Lack of interest by top administrators at this institution	1.9	2.1	2.1	2.0
Inadequate student technical/ computer skills	2.0	2.0	▲2.2	2.0
Copyright issues	2.0	▲1.8	2.0	2.0
Lack of interest on my part	▲1.8	1.6	▲1.5	1.7
Student technophobia	1.7	1.7	▲1.8	1.7
Lack of interest by my department/ division chairperson	1.6	1.7	1.6	1.6
Lack of interest by students	1.5	1.5	1.6	1.5

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

▲This mean is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Faculty questionnaire, question 28.

Exhibit III-43

STUDENTS' PERCEPTIONS OF IMPEDIMENTS TO THEIR OWN INCREASED USE OF COMPUTERS IN DOING SCHOOL WORK, BY TYPE OF INSTITUTION

(Asked Only of Students Who Used a Computer for School Work During the Past Academic Term; Items Listed in Descending Order of Mean Ratings)

	Mean Rating	Not a Barrier	A Minor Barrier	A Moderate Barrier	A Major Barrier
The expense of computers and computer accessories	2.7	22*	20	24	34
Not having appropriate software	2.5	26	25	24	24
Amount of time required to learn how to use computers	2.1	32	32	23	12
Lack of training in how to use computers or in specific computer applications	2.1	36	28	23	13
Lack of convenient access to computers	2.0	43	24	19	14
Lack of use of computer technologies by your instructors	2.0	42	27	17	11
The difficulty of learning	1.8	45	36	15	3
Lack of use of computer technologies by your school, generally	1.8	45	29	16	7
Your own lack of interest in using computers	1.8	48	30	14	8

Mean ratings are based on a 4-point scale, where 1 = not a barrier, 2 = a minor barrier, 3 = a moderate barrier, and 4 = a major barrier. Item percentages may not sum to 100 because "have no idea" responses (all less than 5%) are not shown.

*I.e., 22% of student respondents reported that the expense of computers and computer accessories is not a barrier to their increased use of computers for school work.

Source: Student questionnaire, question 51.

Exhibit III-44

MEAN RATINGS, STUDENTS' PERCEPTIONS OF IMPEDIMENTS TO THEIR OWN INCREASED USE OF COMPUTERS IN DOING SCHOOL WORK, BY TYPE OF INSTITUTION

(Asked Only of Students Who Used a Computer for School Work During the Past Academic Term; Items Listed in Descending Order of Mean Ratings)

	Doctoral	Compre-hensive	Public 2-Year	Other	All Students
The expense of computers and computer accessories	2.6	2.7	2.8	2.7	2.7
Not having appropriate software	2.5	▲2.3	2.6	2.5	2.5
Amount of time required to learn how to use computers	2.2	▲2.0	2.2	2.2	2.1
Lack of training in how to use computers or in specific computer applications	2.2	▲2.0	▲2.3	2.2	2.1
Lack of convenient access to computers	2.1	▲1.9	2.1	2.1	2.0
Lack of use of computer technologies by your instructors	1.9	2.0	2.0	2.0	2.0
The difficulty of learning	1.8	1.7	1.7	1.8	1.8
Lack of use of computer technologies by your school, generally	▲1.7	1.9	▲2.0	1.8	1.8
Your own lack of interest in using computers	1.9	1.8	1.8	1.8	1.8

Mean ratings are based on a 4-point scale, where 1 = not a barrier, 2 = a minor barrier, 3 = a moderate barrier, and 4 = a major barrier.

▲This mean is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Student questionnaire, questions 51 and 69.

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EXPECTATIONS FOR THE FUTURE

CAO respondents at essentially all institutions (96 percent), across all types, expect that the number of faculty who use computers for on-campus instructional purposes will increase over the next 3 years. Smaller percentages, but still substantial majorities, of CAO and Computer questionnaire respondents expect that most types of computer-related expenditures also will increase over the next 3 years (Exhibit III-45). Eighty-six percent of CAO respondents and 78 percent of Computer questionnaire respondents expect that expenditures for PCs will increase, and 77 to 79 percent of Computer questionnaire respondents expect that expenditures for software, technical support, and training will increase. In contrast, only about a fourth of either set of respondents (29 percent of CAO respondents and 25 percent of Computer questionnaire respondents) think that expenditures for supercomputers, mainframes, and minicomputers will increase, and 15 to 21 percent think these expenditures will decrease.

For the most part, there are no large differences by institutional type in these estimates. Both CAO and Computer questionnaire respondents at doctoral universities are less likely than others to expect that mainframe expenditures will increase (e.g., only 16 percent of Computer respondents at both public and private doctoral universities think these expenditures will increase). Also, the percentage of Computer respondents at private doctoral universities who expect that any type of expenditure will increase is about 10 points less than the overall percentage.

Exhibit III-45

HOW THE INSTITUTION'S EXPENDITURES IN EACH LISTED AREA WILL CHANGE OVER THE NEXT 3 YEARS

	Increase	Stay the Same	Decrease
CAO respondents			
Microcomputers and workstations	86*	12	1
Supercomputers, mainframes, and minicomputers	29	47	21
Computer respondents			
Computer-related training of faculty/students	79	19	1
Microcomputers and workstations	78	19	2
Computer software	78	20	1
Computer-resources technical support	77	21	1
Supercomputers, mainframes, and minis	25	56	15

The "stay the same" category includes those who indicated that both current and likely future expenditures in a given area are zero. Item percentages may not sum to 100 because "have no idea" responses (all less than 5%) are not shown.

*I.e., 86% of CAO respondents indicated that they believe expenditures for microcomputers and workstations will increase over the next 3 years.

Sources: CAO questionnaire, question 22.
Computer questionnaire, question 45.

CAO and Computer questionnaire respondents gave very similar responses regarding the types of purchases (upgrades or replacements versus additional equipment) that are likely to be made. Both sets of respondents think that mainframe purchases are much more likely to be replacements or upgrades than additional purchases. Among CAO respondents, 48 percent think they will mostly replace or upgrade, whereas only 6 percent think they will mostly purchase additional equipment; 10 percent think they will do about the same amount of both (Exhibit III-46). In contrast, expectations regarding purchases of PCs and software are much more evenly spread across the three possibilities. There are no appreciable differences by institutional type on these items.

Exhibit III-46

EXPECTATIONS REGARDING TYPES OF PURCHASES OVER THE NEXT 3 YEARS

	No Likely Purchases of This Type	Mostly Will Replace or Upgrade	Mostly Will Purchase Additional Equipment	Will Do About the Same Amount of Replacements and Additional Equipment
CAO respondents				
Supercomputers, mainframes, and minis	33*	48	6	10
Microcomputers and workstations	<1	32	38	30
Computer respondents				
Supercomputers, mainframes, and minis	32	46	5	13
Microcomputers and workstations	<1	38	31	30
Computer software	<1	47	23	29

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*I.e., 33% of CAO respondents indicated that they are not likely to make any purchases of supercomputers, mainframes, or minicomputers over the next 3 years.

Item percentages may not sum to 100 because "have no idea" responses (all less than 5%) are not shown.

Sources: CAO questionnaire, question 23.
Computer questionnaire, question 46.

Expected Changes in Sources of Funding for Instructional Use of Computers/Instructional Technologies

CAO respondents tend to be more optimistic than Computer questionnaire respondents about increases in funding for computers and other instructional technologies over the next 3 years. The two sources that are most likely to be expected to increase by both sets of respondents are (1) general operating funds of the institution and (2) business, industry, and foundation contracts and grants (expected to increase funding by 64 to 65 percent of CAO respondents and 49 to 50 percent of Computer respondents) (Exhibits III-47 and III-48). Two other sources also are expected to increase funding by half or more of CAO respondents: donations and gifts (expected to increase by 60 percent of CAO respondents but by only 43 percent of Computer respondents) and federal contracts and grants (expected to increase by 51 percent of CAO respondents, compared with 41 percent of Computer respondents). Student/faculty use fees as sources of funding are expected to increase by 41 percent of CAO respondents and 33 percent of Computer respondents. The final two potential funding sources listed—special state appropriations and internally generated funds—tend **not** to be sources of funds for instructional technologies. About a third of each group of respondents (35 and 32 percent) say that appropriations are not current or likely future funding sources, and about half (46 and 53 percent) say that internally generated funds are not current or likely sources.

Exhibit III-47

CAO RESPONDENTS' PERCEPTIONS OF LIKELY CHANGES OVER THE NEXT 3 YEARS IN SOURCES OF FUNDING FOR INSTRUCTIONAL TECHNOLOGIES

(Listed in Descending Order of the Percentages Who Expect an Increase)

	Doesn't Apply: Not a Current or Likely Future Source of Funds	Increase	Stay the Same	Decrease	Have No Idea
Business, industry, and foundation contracts and grants	6*	65	20	2	7
General operating funds of the institution	1	64	27	5	2
Donations and gifts	5	60	24	2	10
Federal contracts and grants	11	51	25	3	10
Student/faculty fees for use of computers and other instructional technologies	24	41	29	1	4
Special state appropriations	35	20	23	8	15
Internally generated funds (e.g., licensing of institutionally produced software)	46	14	22	1	15

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*I.e., 6% of respondents indicated that business, industry, and foundation contracts and grants are not a current or likely future source of funds for instructional technologies.

Source: CAO questionnaire, question 24.

Exhibit III-48

COMPUTER QUESTIONNAIRE RESPONDENTS' PERCEPTIONS OF LIKELY CHANGES OVER THE NEXT 3 YEARS IN SOURCES OF FUNDING FOR INSTRUCTIONAL TECHNOLOGIES

(Listed in Descending Order of the Percentages Who Expect an Increase)

	Doesn't Apply: Not a Current or Likely Future Source of Funds	Increase	Stay the Same	Decrease	Have No Idea
General operating funds of the institution	1*	50	39	7	3
Business, industry, and foundation contracts and grants	10	49	27	1	13
Donations and gifts	9	43	33	1	14
Federal contracts and grants	14	41	27	4	14
Student/faculty fees for computer use	32	33	28	1	6
Special state appropriations	32	20	25	7	16
Internally generated funds (e.g., licensing of institutionally produced software)	53	13	24	1	9

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*I.e., 1% of respondents indicated that the general operating funds of the institution are not a current or likely future source of funds for instructional use of computers.

Source: Computer questionnaire, question 47.

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IV. COMPUTER NETWORKS

INTRODUCTION

This chapter is concerned with computer networks, including campus networks, community networks that are run by colleges and universities, and Internet and Bitnet. Data reported in this chapter are based largely on responses to the faculty, student, and Computer questionnaires; a few questions discussed here were asked of Chief Academic Officer (CAO) respondents. See Chapter II for a description of the institutional, faculty, and student samples and respondents and for definitions of the various types of institutions discussed below.

FACULTY AND STUDENT USE OF NETWORK SERVICES

A large majority of faculty (83 percent) reported that they have computer network services available to them, and over half use these services (61 percent used them in the past 30 days) (Exhibit IV-1). Use of network services for general activities (i.e., not necessarily school-related) by students is somewhat lower but still substantial—45 percent of students reported using these services during the past academic term[1]. Forty-five percent of students also reported that the computer they use most often for school work has a modem ("that is, a device that provides dialup access to other computers, networks, and so on").

The most widely used network service, especially by faculty, is e-mail; 54 percent of faculty used e-mail in the past 30 days, and 31 percent of students used it during the past term. Faculty are much more likely to use e-mail (or computer conferencing) to communicate with their colleagues (53 percent did so) than with their students (29 percent), but students are equally likely to communicate electronically with other students (16 percent) as with their instructors (14 percent). Very few faculty **require** students to use e-mail or computer conferencing to communicate either with other students (4 percent) or with themselves (7 percent).

After e-mail, the most commonly used service of the general network activities is accessing programs or files maintained on a file server—26 percent of faculty and 21 percent of students reported that they had used this service. Other general activities are used by no more than a fifth of either faculty or students. For all types of general activities, the percentages of faculty who are aware that the services are available to them are considerably higher than the percentages who actually use the services.

Of the network-related activities done by students as part of their school work or by faculty for research or instruction-related purposes, by far the most common is accessing computerized bibliographic resources, such as on-line card catalogs, DIALOG, or ERIC. About half of the students (48 percent) did this in the past term, and 43 percent of faculty did it during the 1993 Fall Term. Also, a fifth of the faculty (20 percent) reported that their students were required to do this to complete one or more assignments. A third of the students (33 percent) reported that they accessed computerized full-text resources during the past term, whereas only 21 percent of faculty did so. Few faculty (8 percent) required students to use electronic full-text resources.

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[1] The student interview asked about the most recent academic term that the respondent had attended.

Exhibit IV-1

AVAILABILITY AND USE OF VARIOUS NETWORK-RELATED SERVICES AND ACTIVITIES

	Students Used/Did in Past Term (1)	Faculty to Whom Service Is Available (2)	Faculty Used/Did in Past 30 Days (2)	Faculty Required Students to Do (2)
General services and activities (not necessarily part of school work or for research or instructional purposes)				
E-mail	31*	77	54	—
Programs or files maintained on a file server	21	54	26	—
Logged on to computers at other schools or other organizations—for example, via telnet	14	48	20	—
Logged on to online bulletin boards (other than UseNet news groups)	13	47	17	—
Computer conferencing (real-time online conversations with one or more other individuals)	11	32	6	—
File Transfer Protocol, or FTP	11	47	19	—
Any of the above	45	83	61	—
Done as part of school work (by students) or for research or instructional purposes (by faculty)			**Done/Required During 1993 Fall Term**	
Accessed a computerized bibliographic resources, such as online card catalogs, DIALOG, or ERIC	48	—	43	20
Accessed computerized full-text resources—e.g., computerized encyclopedias or news services	33	—	21	8
Used a computer to access any other kind of database	22	—	—	—
Used e-mail or computer conferencing to communicate with students about school work	16	—	29	4
Used e-mail or computer conferencing to communicate with instructors/colleagues about school work	14	—	53	7
Logged on to an online news group or bulletin board	6	—	18	3

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*I.e., 31% of students used e-mail during the most recent academic term.

—This question was not asked.

Sources: (1) Student questionnaire, questions 20 and 36 through 47.
(2) Faculty questionnaire, questions 16 and 19 through 21.

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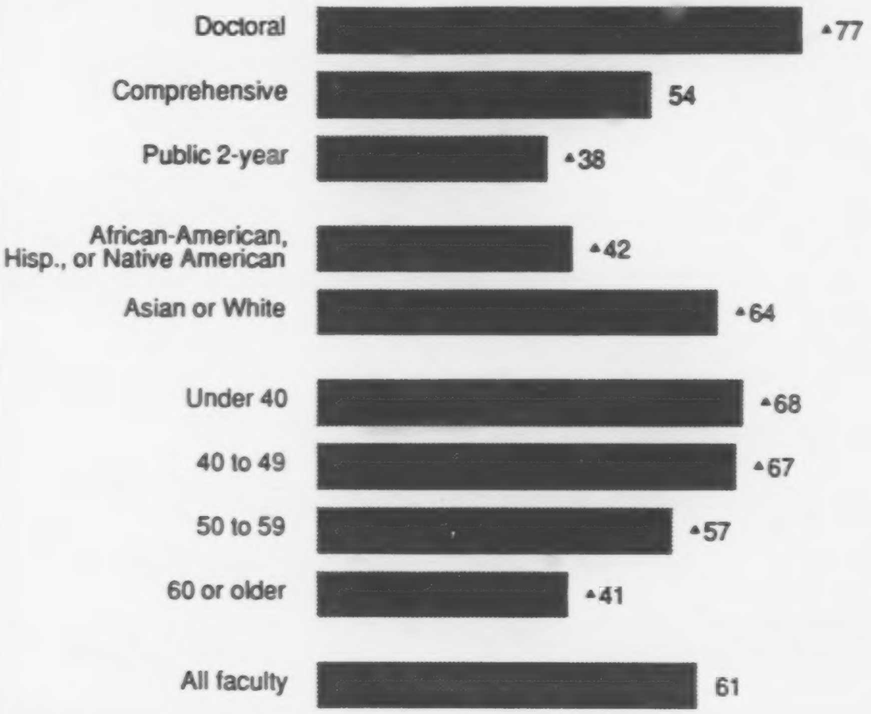
As shown in Exhibits IV-2 and IV-3, faculty use of these various network-related activities is most strongly related to type of school, but it also is related to race/ethnicity, age, and program area. It is not related to academic rank (among faculty at 4-year schools), tenure status, or gender. By type of school, the percentage of faculty who used any of the general network services in the past 30 days ranges from 38 percent of those in public 2-year schools to 77 percent of those at doctoral schools. Among the racial/ethnic groups, 42 percent of targeted minorities used the services, compared with 64 percent of Asians and whites. By age, 41 percent of those age 60 or over used the services, versus 57 to 68 percent of their younger counterparts.

Exhibit IV-2

PERCENTAGE OF FACULTY WHO USED ANY COMPUTER NETWORK SERVICES IN THE PAST 30 DAYS, BY TYPE OF SCHOOL, RACE/ETHNICITY, AND AGE



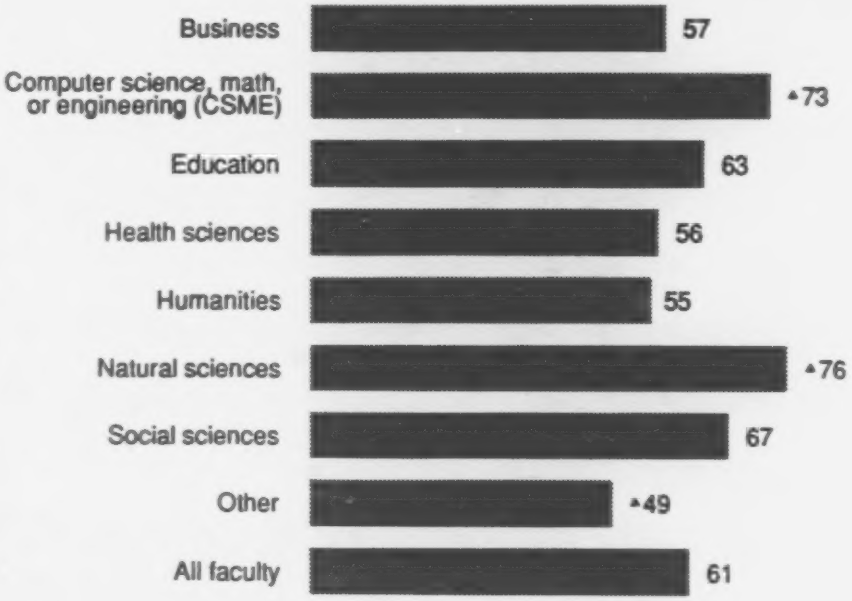
▲This percentage is statistically significantly different from that for all other types of faculty combined ($p < .05$).

Source: Faculty questionnaire, questions 16, 35, and 36.

By program area, faculty in CSME and natural sciences are the most likely to have used network services (73 and 76 percent, respectively), while those in "other" fields are the least likely to have done so(49 percent).

Exhibit IV-3

PERCENTAGE OF FACULTY WHO USED ANY COMPUTER NETWORK SERVICES IN THE PAST 30 DAYS, BY PROGRAM AREA



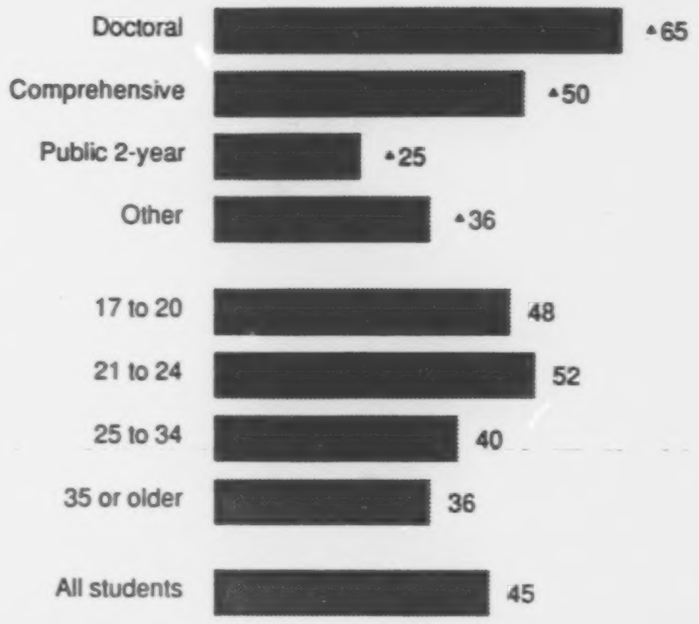
▲This percentage is statistically significantly different from that for all other types of faculty combined ($p < .05$).

Source: Faculty questionnaire, question 16.

Among students, use of the various network services and activities is quite consistently related to type of school and age, but not to academic year (among students in 4-year schools), academic major, race/ethnicity, or gender. As with faculty, network use among students is highest in the doctoral universities and lowest in the public 2-year schools. About two-thirds of students (65 percent) in doctoral universities used some kind of network services during the past academic term, compared with 50 percent of those in comprehensive schools and only 25 percent of those at public 2-year schools (Exhibit IV-4). Younger students also are more likely to be network users than their older counterparts. About half of those under age 25 (48 and 52 percent) used network services, compared with 40 and 36 percent of those age 25 or older.

Exhibit IV-4

PERCENTAGE OF STUDENTS WHO USED ANY COMPUTER NETWORK SERVICES DURING THE PAST TERM, BY TYPE OF SCHOOL AND AGE



▴This percentage is statistically significantly different from that for all other types of students combined ($p < .05$).

Source: Student questionnaire, questions 36, 69, 73, and 75.

CAMPUS COMPUTER NETWORKS

According to Computer questionnaire respondents, 7 in 10 institutions (71 percent) currently have a campus network that provides for a hard-wired connection among microcomputers throughout their institution. (The network may or may not include one or more mainframes.) As with faculty and student use of network services, availability of campus networks is lowest at the 2-year colleges (52 and 62 percent of the private and public 2-year schools, respectively) and highest at the doctoral universities (97 and 98 percent) (Exhibit IV-5). The vast majority of all kinds of schools (and virtually all of the doctoral and comprehensive schools) expect to have a campus network within the next 3 years if they do not already have one.

Exhibit IV-5

PERCENTAGE OF INSTITUTIONS WITH CAMPUS COMPUTER NETWORKS, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Have now	▲97[*]	▲98	▲85	77	70	▲62	▲52	71
Plan to have within the next 3 years	▲3	▲0	10	16	16	18	20	15
Neither have nor plan to have	▲0	▲2	▲5	▲7	14	▲20	▲28	14

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[*] I.e., 97% of public doctoral institutions currently have a campus computer network.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 18.

Among the faculty, 71 percent reported that their institution has a campus network with hard-wired PC connections, although 15 percent are not sure whether they do or not. Differences by institutional type are parallel to those reported above. Fifty-two percent of the faculty at public 2-year schools, 68 percent of those at comprehensive schools, and 82 percent of those at doctoral schools reported that their school has a campus network. Of those whose institution has such a network, the vast majority—84 percent—reported that they have access to it. However, this percentage is lower among public 2-year-school faculty than among faculty from other types of schools—66 percent vs. 86 to 88 percent. Thus, public 2-year schools are less likely to have campus networks, and among those that do, their faculty are less likely to have access to it.

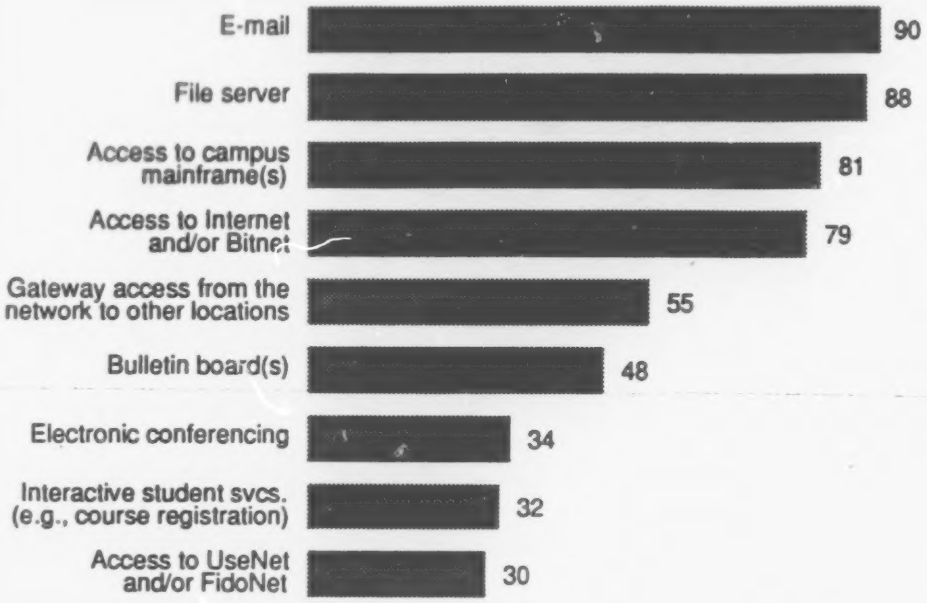
Services Available on Campus Networks

Almost all campus computer networks provide e-mail (90 percent) and file server (88 percent) services (Exhibit IV-6), and very large majorities provide access to the campus mainframe(s) (81 percent) and to Internet and/or Bitnet (79 percent). About half of the institutions provide gateway access from the network to other locations (55 percent) and provide bulletin boards (48 percent). Only about a third provide electronic conferencing (34 percent), interactive student services, such as course registration (32 percent), or access to UseNet and/or FidoNet (30 percent). Patterns of differences by institutional type in the availability of these various services tend to parallel those for overall availability of campus networks.

Exhibit IV-6

PERCENTAGE OF INSTITUTIONS WITH SELECTED SERVICES AVAILABLE ON THE CAMPUS COMPUTER NETWORK

(Of Those Institutions That Have a Campus Computer Network)



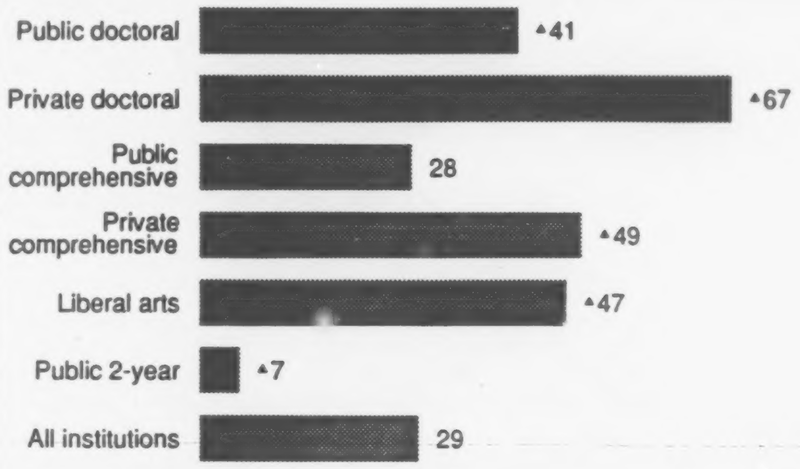
Source: Computer questionnaire, question 21.

Although e-mail services in general are available at almost all institutions with campus networks, student e-mail accounts still seem to be relatively uncommon. Fewer than a third of the institutions (29 percent) estimated that half of more of their students have e-mail accounts, 12 percent estimated that between 25 and 49 percent have accounts, 28 percent estimated that no more than a fourth have accounts, and another 28 percent reported that none of their students have accounts. However, as shown in Exhibit IV-7, there are substantial differences by type of institution, ranging from 67 percent of private doctoral universities to only 7 percent of public 2-year colleges that estimated that at least half of their students have e-mail accounts.

Exhibit IV-7

PERCENTAGE OF INSTITUTIONS AT WHICH HALF OR MORE OF THE STUDENTS ARE ESTIMATED TO HAVE E-MAIL ACCOUNTS, BY TYPE OF INSTITUTION

(Of Those Institutions That Have a Campus Computer Network)



Note: Private 2-year results are not reported here because there are too few responses to provide a reliable estimate.

▲This percentage is statistically significantly different from that for all other types of schools combined (p < .05).

Source: Computer questionnaire, question 22.

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The transmission of video over campus networks currently is quite rare (only 13 percent of all institutions do so), but another 30 percent plan to do so within the next 3 years (Exhibit IV-8). As with student e-mail accounts, there are substantial differences by type of institution, ranging from only 4 percent of liberal arts schools who currently transmit video over their computer network to almost half (45 percent) of public doctoral institutions. Also, among 4-year schools, the public schools are more likely than their private counterparts to transmit video.

Exhibit IV-8

PERCENTAGE OF INSTITUTIONS THAT TRANSMIT VIDEO OVER THE CAMPUS COMPUTER NETWORK, BY TYPE OF INSTITUTION

(Of Those Institutions That Have a Campus Computer Network)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Do so now	▲45*	15	▲25	13	▲4	▲8	—	13
Plan to do so within the next 3 years	29	▲41	30	31	▲23	33	—	30
Neither do now nor plan to do	▲26	▲43	▲45	56	▲73	59	—	57

*I.e., 45% of public doctoral institutions that have a campus computer network transmit video over it.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

—Too few cases to provide a reliable estimate.

Source: Computer questionnaire, question 20.

Dialup and Hard-Wired Access to the Campus Network

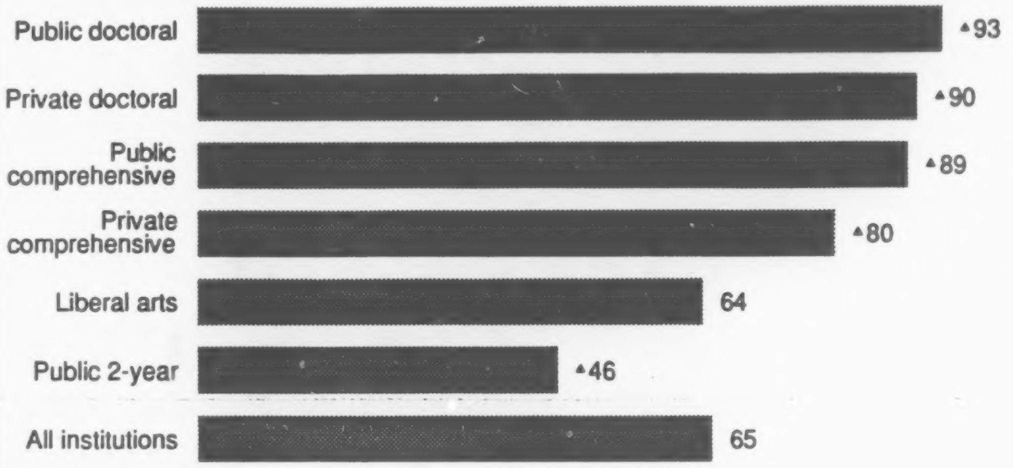
Among institutions with campus networks, about two-thirds (65 percent) provide dialup access to the campus network from off-campus, and 27 percent have hard-wired connections between the network and off-campus locations. There are similar differences by institutional type for the two types of access; differences for dialup access are presented in Exhibit IV-9. Doctoral and public comprehensive universities are the most likely to provide dialup access from off-campus (89 to 93 percent), and public 2-year schools are the least likely to provide it (46 percent).

Among faculty overall, 54 percent are aware that they have dialup access from off campus—74 percent of those at doctoral universities, 53 percent of those at comprehensive schools, and 24 percent of those at public 2-year schools. Another 23 percent are not sure whether they have dialup access. A fourth of the faculty (24 percent) have used this capability in the past 30 days.

Exhibit IV-9

PERCENTAGE OF INSTITUTIONS WITH DIALUP ACCESS TO THE CAMPUS COMPUTER NETWORK FROM OFF-CAMPUS LOCATIONS, BY TYPE OF INSTITUTION

(Of Those Institutions That Have a Campus Computer Network)



Note: Private 2-year results are not reported here because there are too few responses to provide a reliable estimate.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 21.

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Almost all schools with campus networks (92 percent) provide hard-wired connections between the network and at least some faculty offices and at least some classrooms/student labs (Exhibit IV-10). Fifty-four percent estimated that at least half of their faculty offices are hard-wired to the campus network, and 47 percent estimated that at least half of their classrooms and student labs have hard-wired connections. Eighty-four percent of the schools provide hard-wired network connections with at least one library. Least common are hard-wired connections with residence halls. Among those schools that provide on-campus student residences, only about half (48 percent) provide connections to any residences, and only a fourth (24 percent) provide connections to half or more of the residences.

Exhibit IV-10

ESTIMATED PERCENTAGES OF VARIOUS FACILITIES THAT ARE HARD-WIRED TO THE CAMPUS COMPUTER NETWORK

(Of Those Institutions That Have a Campus Computer Network)

	None	1% to 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%
Faculty offices	8*	24	14	14	12	28
Classrooms and student labs	8	28	16	14	10	23
Libraries	14	9	5	5	7	58
Residence halls (schools with on-campus residences)	52	18	5	6	3	15

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*I.e., 8% of respondents at schools that have a campus computer network estimated that none of their faculty's offices were hard-wired to the network.

Source: Computer questionnaire, question 19.

Exhibit IV-11 shows differences by institutional type in the percentages of institutions that have more than 50 percent of the various facilities hard-wired to the network. With the exception of private doctoral institutions, which have consistently high percentages here, the patterns vary considerably across the types of facilities. For example, public doctoral institutions are more likely than average to have hard-wired a majority of faculty offices, libraries, and residence halls to the network, but less likely than average to have hard-wired a majority of classrooms and student labs.

Exhibit IV-11

INSTITUTIONS IN WHICH MORE THAN 50% OF VARIOUS FACILITIES ARE HARD-WIRED TO THE CAMPUS COMPUTER NETWORK, BY TYPE OF INSTITUTION

(Of Those Institutions That Have a Campus Computer Network)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	All Institutions
Faculty offices	▲62*	▲69	56	▲64	59	▲43	53
Classrooms and student labs	▲38	▲56	43	53	44	49	47
Libraries	▲89	▲92	▲78	▲83	71	▲58	70
Residence halls (schools with on-campus residences)	▲31	▲53	23	▲33	19	—	22

Note: Private 2-year results are not reported here because there are too few responses to provide a reliable estimate.

*I.e., 62% of respondents at schools that have a campus computer network estimated that 50% or more of their faculty's offices were hard-wired to the network.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

—Too few responses to provide a reliable estimate.

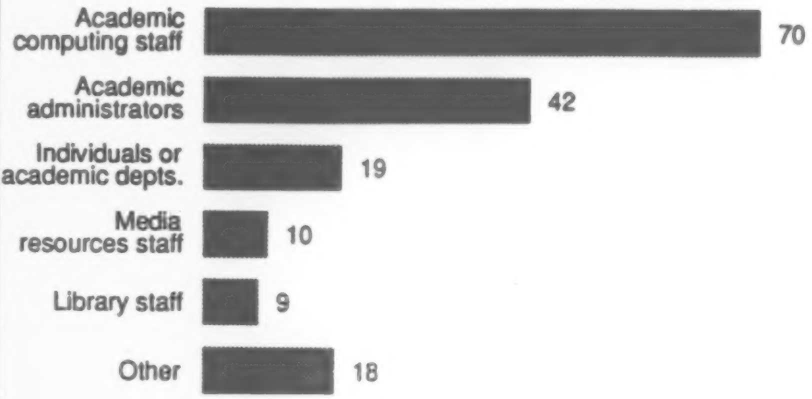
Source: Computer questionnaire, question 19.

Leadership in the Development of Campus Networks

According to CAO respondents, at most schools, leadership or direction in the development of campus network systems typically is provided by academic computing staff (70 percent) and/or by academic administrators (42 percent) (Exhibit IV-12). Individual faculty or academic departments are relatively unlikely to provide leadership in this area, as are library staff or media resources staff.

Exhibit IV-12

PERCENTAGE OF INSTITUTIONS AT WHICH SPECIFIED GROUPS PROVIDE LEADERSHIP OR DIRECTION IN THE DEVELOPMENT OF CAMPUS NETWORK SYSTEMS



Source: CAO questionnaire, question 18e.

COMMUNITY COMPUTER NETWORKS

Participation by higher education institutions in community computer networks (e.g., for local K-12 schools or community organizations) is relatively uncommon, but again there is substantial variability by type of institution. Overall, 14 percent of institutions operate or participate in a community network, but this percentage ranges from almost no private 2-year schools (2 percent) to half (49 percent) of public doctoral schools (Exhibit IV-13). Public schools are considerably more likely than their private counterparts to participate in a community network. About a fifth of the institutions (22 percent) reported that they plan to operate or participate in a community network within the next 3 years.

Exhibit IV-13

PERCENTAGE OF INSTITUTIONS THAT OPERATE OR PARTICIPATE WITH OTHER ORGANIZATIONS IN OPERATING A COMMUNITY COMPUTER NETWORK FOR LOCAL (K-12) SCHOOLS, COMMUNITY ORGANIZATIONS, ETC., BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Do now	▲49*	▲28	▲27	▲8	▲6	11	▲2	14
Plan to do so within the next 3 years	23	▲14	27	23	21	23	▲11	22
Neither do now nor plan to do	▲28	58	▲47	69	▲73	65	▲87	64

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*I.e., 49% of public doctoral institutions currently operate or participate with other organizations in operating a community computer network for local (K-12) schools, community organizations, etc.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 31.

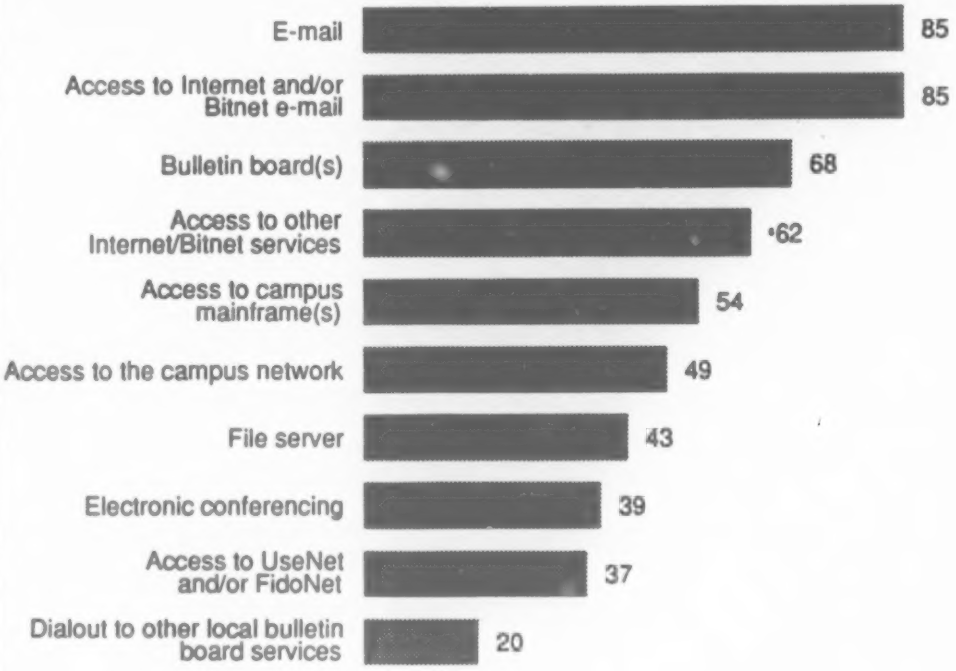
Most institutions that participate in a community network provide technical or administrative support (78 percent), use of hardware (e.g., host computer) (64 percent), and/or dedicated-line access to Internet/Bitnet (53 percent). Half (49 percent) provide training in network use. Only 20 percent provide funding.

As shown in Exhibit IV-14, services provided by a majority of community networks are e-mail and access to Internet/Bitnet e-mail (85 percent), bulletin boards (68 percent), access to Internet/Bitnet services other than e-mail (62 percent), and access to the campus mainframe(s) (54 percent).

Exhibit IV-14

PERCENTAGE OF INSTITUTIONS WITH COMMUNITY COMPUTER NETWORKS THAT PROVIDE VARIOUS SERVICES

(Of Those Institutions That Participate in a Community Computer Network)



Source: Computer questionnaire, question 32.

INTERNET/BITNET

Seven in 10 institutions currently provide access to the Internet or Bitnet—almost all doctoral and public comprehensive schools, 85 percent of private comprehensives, and 63 percent of liberal arts and public 2-year schools (Exhibit IV-15). Only private 2-year schools are unlikely to have Internet/Bitnet access (21 percent). Almost all institutions (all but 2 percent) that provide access to one of these two networks provide access to the Internet. Overall, 68 percent provide access to the Internet and 33 percent provide access to Bitnet. Among all the 4-year schools, those that provide access to either network are most likely to be a node (that is, to maintain a dedicated line to the network). Two-year schools are more likely to provide access through another education, government, or other noncommercial institution.

Exhibit IV-15

PERCENTAGE OF INSTITUTIONS THAT PROVIDE ACCESS TO INTERNET OR BITNET, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Current access of any kind to either Internet or Bitnet	▲100*	▲98	▲97	▲85	▲63	▲63	▲21	70
Access to Internet	▲100	▲94	▲95	▲84	▲61	▲60	▲21	68
The institution is a node (i.e., it maintains a dedicated line to the network)	▲95	▲86	▲75	▲66	45	▲24	▲8	45
Access is provided through a commercial party (e.g., CompuServe)	1	2	1	2	4	1	1	2
Access is provided through another education, government, or other noncommercial institution	▲4	▲6	19	16	▲13	▲35	▲12	22
No access now but plan to provide within the next 3 years	▲0	▲2	▲5	▲13	▲31	▲29	▲43	23
No access now and no plans to provide	▲0	▲4	▲0	▲3	8	11	▲36	9
Access to Bitnet	▲75	▲66	▲59	29	▲24	▲28	▲0	33
The institution is a node (i.e., it maintains a dedicated line to the network)	▲61	▲58	▲37	17	▲12	▲10	▲0	18
Access is provided through a commercial party (e.g., CompuServe)	1	2	1	0	2	1	0	1
Access is provided through another education, government, or other noncommercial institution	12	▲6	▲21	11	11	17	▲0	14
No access now but plan to provide within the next 3 years	▲0	▲2	4	▲2	▲10	5	11	6
No access now and no plans to provide	▲25	▲32	▲37	69	66	▲67	▲89	61

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*I.e., 100% of public doctoral institutions have access to either Internet or Bitnet.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 34.

Faculty and Student Access

According to the Computer questionnaire respondents, faculty have access to at least some Internet/Bitnet services at the vast majority of schools (82 percent). Sixty-five percent of the faculty themselves report that they have access to the Internet, and 31 percent report that they have access to Bitnet. (Of those who have access, a very large majority—89 percent—are provided access by their school.) Schools are most likely to provide faculty with access to e-mail (81 percent of schools provide e-mail access), file transfer protocol (FTP) services (75 percent), and terminal emulation or virtual terminal facility services, such as Telnet (73 percent) (Exhibit IV-16). Slightly over half (55 percent) provide access to UseNet news groups, although only 11 percent of the faculty reported actually accessing these.

Very large majorities (in some cases all) of the various types of 4-year schools provide e-mail, FTP, and Telnet-like services to most faculty. Access to UseNet news groups is provided by somewhat smaller percentages, especially at the nondoctoral schools. Public 2-year schools are considerably less likely than their 4-year counterparts to provide any of these services to their faculty. (Too few private 2-year schools have access to report their responses.)

Exhibit IV-16

PERCENTAGES OF INSTITUTIONS THAT PROVIDE VARIOUS INTERNET/BITNET SERVICES TO MOST FACULTY, BY TYPE OF INSTITUTION

(Of Those Institutions That Provide Access to Internet or Bitnet))

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	All Inst's
Address or e-mail	▴100*	▴100	▴87	▴90	▴91	▴63	81
FTP	▴99	▴100	▴83	▴86	▴82	▴54	75
Terminal emulation/virtual terminal facility (Telnet)	▴99	▴98	▴82	▴84	▴85	▴50	73
UseNet news groups	▴96	▴92	▴74	49	56	▴33	55

Note: Private 2-year results are not reported here because there are too few responses to provide a reliable estimate.

*I.e., all public doctoral institutions that provide access to the Internet or Bitnet provide address/e-mail access to most faculty.

▴This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 35.

Two-thirds of the schools (65 percent) allow student access to Internet or Bitnet services. As with faculty access, the most common service provided is e-mail (61 percent), FTP (59 percent), and Telnet-like services (58 percent) (Exhibit IV-17). Slightly fewer than half (43 percent) give students access to UseNet news groups (which were accessed by only 6 percent of students during the past term). As with faculty access, public 2-year schools are far less likely to provide access to students than are the 4-year schools. For example, student access to Internet e-mail is provided by essentially all doctoral schools (96 and 98 percent) and by about three-fourths of comprehensive and liberal arts schools (77 percent), but by only about a fourth (27 percent) of the public 2-year schools.

Exhibit IV-17

PERCENTAGE OF INSTITUTIONS THAT PROVIDE VARIOUS INTERNET/BITNET SERVICES TO MOST STUDENTS, BY TYPE OF INSTITUTION

(Of Those Institutions That Provide Access to Internet or Bitnet))

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	All Inst's
Address or e-mail	▲96*	▲98	▲77	▲77	▲77	▲27	61
FTP	▲92	▲96	▲74	▲73	▲68	▲31	59
Terminal emulation/virtual terminal facility (Telnet)	▲93	▲94	▲73	▲72	▲68	▲29	58
UseNet news groups	▲92	▲90	▲61	45	44	▲16	43

Note: Private 2-year results are not reported here because there are too few responses to provide a reliable estimate.

*I.e., 96% of public doctoral institutions that provide access to the Internet or Bitnet provide address/e-mail access to most students.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 38.

Among the students themselves, 30 percent reported that they had access to the Internet during the most recent academic term, and 8 percent said they had access to Bitnet; 32 percent had access to either the Internet or Bitnet. Consistent with the institutional-level findings, students at doctoral schools were most likely to have access to either Internet or Bitnet (49 percent), followed by those at comprehensive schools (36 percent), with lowest access among those at public 2-year schools (14 percent). Among those students with Internet/Bitnet access, the vast majority (86 percent) obtained access through their school. Fewer than 10 percent obtained access through any other organization or service. Sixteen percent reported that they themselves had to pay to use Internet/Bitnet services.

Other Internet/Bitnet Services

Among the institutions that provide access to the Internet or Bitnet, about half (48 percent) make available indexes of their information resources for users to access via search tools such as Gopher, Archie, WhoIs, and Finger, and 31 percent maintain mailing lists (e.g., of special interest groups) for Internet or Bitnet users. Differences by institutional type parallel those described above regarding other Internet/Bitnet issues.

About half the Internet/Bitnet institutions (54 percent) make it possible for at least some Internet/Bitnet users outside their organization (for example, researchers or students from other institutions, the public, etc.) to access their institution's computing resources, databases, and so on. As shown in Exhibit IV-18, considerably the most common type of access provided is read-only access to online library card catalogs, provided by 45 percent of institutions that provide Internet/Bitnet access. About a fourth provide read-only access to other public access databases or text files (27 percent) and/or FTP access to databases or text files (24 percent). Fewer than a fifth provide any other kind of access.

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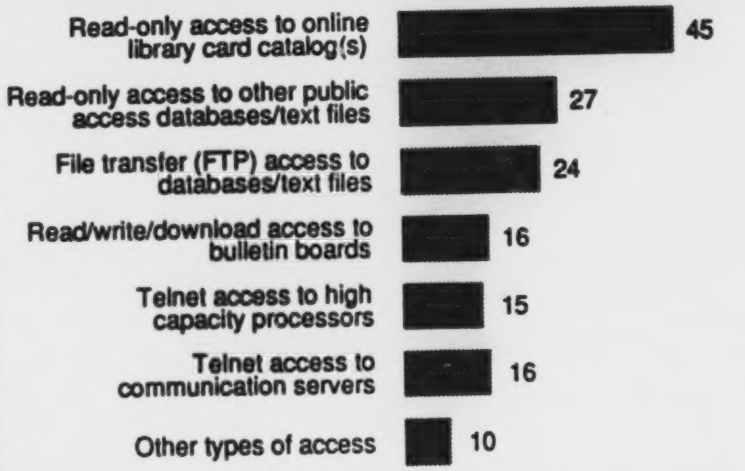
Exhibit IV-18

PERCENTAGE OF INSTITUTIONS THAT PROVIDE OUTSIDE INTERNET/BITNET USERS[a] WITH SELECTED FORMS OF ACCESS TO THE INSTITUTION'S COMPUTING RESOURCES, DATABASES, ETC.

(Of Those Institutions That Provide Access to Internet or Bitnet)



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[a] E.g., researchers or students from other institutions, the public, etc.

Source: Computer questionnaire, question 42.

Internet/Bitnet Policies

Of the CAO respondents at institutions that provide access to the Internet or Bitnet, slightly fewer than half (44 percent) reported that their institution has written policies regarding Internet/Bitnet access by faculty and/or students. By type of institution, the percentages that have these policies range from a high of 57 percent of the public comprehensives to a low of 24 percent of the public 2-year schools.

Almost no schools (5 percent) charge their faculty for any kind of Internet or Bitnet use. Unlike the charge policies for computer use reported in Chapter II, even the doctoral institutions are not likely to charge. Only 10 and 14 percent of private and public doctoral institutions, respectively charge for Internet/Bitnet use. The few that do charge do so most often for funded research activities and, to a lesser extent, for personal use. Similarly, relatively few schools (15 percent) charge students for use of the Internet or Bitnet. Public doctoral schools are more likely than other schools to do so (27 percent). At 10 percent of schools, these charges are included in student fees, and at 4 percent they are included in specific course fees. A third of the schools (34 percent) place some restrictions on students' personal use of the Internet or Bitnet. There are no appreciable differences in this percentage by institutional type.

According to CAO respondents, at 80 percent of institutions that provide Internet/Bitnet access, leadership or direction in Internet/Bitnet access issues is provided by academic computing staff. Academic administrators, such as deans, provide leadership at 29 percent of institutions, and library staff provide leadership at 22 percent of institutions.

FACULTY AND STUDENT TRAINING IN COMPUTER NETWORKS

Internet/Bitnet Training

Of schools that provide faculty and student access to the Internet or Bitnet, very few require training in Internet/Bitnet access or use of either faculty (4 percent) or students (8 percent), but about three-quarters (78 percent) offer it to students and even more—90 percent—offer it to faculty. Among the faculty, about a fourth (28 percent) reported that they themselves have received Internet/Bitnet training. The relatively recent growth of these networks is reflected in the finding that the vast majority of faculty who have received Internet/Bitnet training (81 percent) have done so in the past 3 years. Among the students, a third (32 percent) of those who used a computer to do school work in the past term (26 percent of all students) are aware that their school provides Internet/Bitnet training or assistance (another third don't know whether the school provides training); 15 percent have received such training or assistance.

Training in Use of Online and CD-ROM Resources

As with Internet/Bitnet training, 24 percent of the faculty also reported that they have received training in how to access and use online or CD-ROM resources, such as databases and card catalogs, and a large majority (77 percent) of these received this training in the last 3 years.

Considerably more students than faculty have received this kind of training. Among students who used a computer for school work during the past term, almost half (44 percent) reported that they have received training in how to access and search an online card catalog or other bibliographic resources. However, only 10 percent have received training in how to access online full-text resources, such as NEXIS, Dow-Jones, or Reuters, and the same percentage have received training in how to access or participate in online bulletin boards or computer conferences.

TELEPHONE AND VOICE MAIL SYSTEMS

Slightly fewer than half (46 percent) of the institutions have a voice mail system for all or parts of the campus, and another 13 percent plan to have such a system within the next 3 years. Doctoral institutions are far more likely than others to have these systems, whereas the 2-year schools are relatively unlikely to have them (Exhibit IV-19).

Exhibit IV-19

VOICE MAIL SYSTEM ISSUES, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Have a voice mail system	▲88*	▲88	44	52	47	▲38	▲29	46
50% or more of the full-time regular faculty have voice mail boxes	▲46	▲52	72	80	▲87	▲89	82	78
50% or more of students in institutionally owned residences have voice mail boxes (schools that have on-campus student residences)	18	▲30	16	24	▲26	—	—	20

*I.e., 88% of public doctoral institutions currently have a voice mail system for all or parts of the campus.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

—Too few respondents to provide a reliable estimate.

Source: Computer questionnaire, questions 26, 27, and 30.

Among schools with voice mail systems, 78 percent estimated that at least half of their full-time regular faculty have voice mail boxes. This percentage seems to be inversely related to the school's size, ranging from low of 46 percent of public doctoral institutions to highs of 87 percent and 89 percent of liberal arts and public 2-year schools. According to faculty self-reports, 45 percent of the faculty have voice mail on their phone—41 percent of those in doctoral schools, 38 percent of those in comprehensive schools, and 68 percent of those in public 2-year schools.

In contrast, voice mail boxes for students who live on campus are relatively rare. Among the 61 percent of schools that have on-campus student residences, 60 percent do not provide voice mail boxes for any residential students, and only 20 percent provide voice mail boxes for 50 percent or more of the residential students (ranging from 16 percent of public comprehensive schools to 30 percent of private doctoral schools). Reports from the students themselves indicate that 16 percent of students who lived on campus had voice mail on the phone in their room.

Among the 71 percent of schools with a campus computer network, 19 percent have integrated most or all of the institution's telephone system with that network, and 15 percent provide voice mail services through the network. Private doctoral schools are more likely than others to have integrated their telephone system and computer network (28 percent of those with networks have integrated the network and their phone system).

Almost all schools (91 percent) have installed telephone lines in more than 90 percent of their faculty offices. (Ninety-nine percent of the faculty reported that they have a telephone in their office.) Also, among schools that have on-campus student residences, 74 percent have installed phone lines in more than 90 percent of student dorm rooms. In accord with this finding, almost all students (95 percent) who lived on campus reported that they have a telephone in their room.

In contrast, relatively few schools (22 percent) have phone lines in at least half of their classrooms and student labs (Exhibit IV-20). Half (51 percent) estimated that they have phone lines in between 1 and 25 percent of the classrooms and student labs, and 13 percent said that none of these rooms have phone lines. Private doctoral institutions are the most likely to have phone lines in classrooms and labs (32 percent have phone lines in more than 90 percent of their classrooms/labs, compared with 8 to 19 percent of other schools), whereas private 2-year schools are the least likely to do so (42 percent have no classrooms/labs with phone lines vs. 0 to 18 percent of other schools).

Exhibit IV-20

ESTIMATES OF THE PERCENTAGE OF CLASSROOMS AND STUDENT LABS IN WHICH TELEPHONE LINES HAVE BEEN INSTALLED, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
None	▲0*	▲4	▲2	▲2	12	▲18	▲42	13
1% to 24%	51	44	56	45	53	53	▲33	51
25% to 49%	15	▲6	13	16	9	10	9	11
50% to 74%	4	8	7	10	7	4	4	6
75% to 90%	▲12	2	4	2	3	4	4	4
More than 90%	11	▲32	13	▲19	12	▲8	9	12
Have no idea	7	4	5	5	4	3	0	4

*I.e., 0% of public doctoral institutions reported that telephone lines have been installed in none of their classrooms or student labs.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Computer questionnaire, question 25b.

BENEFITS AND ACCOMPLISHMENTS TO DATE

On average, respondents believe that their institution has done moderately well in addressing issues of student access to computers, databases, and networks but less well in using communications technologies such as e-mail and networking to increase the frequency, convenience, and/or quality of student-faculty interactions. The former issue was asked of CAO and Computer questionnaire respondents.[2] Just under two-thirds of each of these groups (62 and 63 percent, respectively) gave their institution a rating of "moderately well" or "very well" (3 or 4) on the former issue (both had mean

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[2] Respondents were asked to use a 4-point scale (1 = not at all, 2 = not very well, 3 = moderately well, and 4 = very well) to indicate how well their institution has accomplished various issues.

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ratings of 2.7). The latter issue was asked of CAO, Computer, Instructional Technologies, Library, and Faculty questionnaire respondents. Only 34 to 40 percent of each of these groups gave ratings of 3 or 4 on the latter issue (mean ratings of 2.2 to 2.3).

As Exhibit IV-21 illustrates with CAO responses, there are substantial differences among institutions. On the student access issue, the mean ratings range from 2.6 at public 2-year schools (55 percent of the respondents gave a rating of 3 or 4) to 3.3 at private doctoral universities (88 percent gave a rating of 3 or 4). On the student-faculty interaction issue, the mean ratings range from 1.9 at private 2-year schools (only 19 percent of the respondents gave a rating of 3 or 4) to 2.9 at private doctoral universities (67 percent gave a rating of 3 or 4). These relatively low ratings are consistent with the findings reported in Chapter II that only 29 percent of faculty believe that their contacts with students have benefited a moderate amount or a great deal from computers and other instructional technologies.

Exhibit IV-21

CAO RESPONDENTS' MEAN RATINGS OF PERCEIVED INSTITUTIONAL COMPUTER NETWORK-RELATED ACCOMPLISHMENTS, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Addressed issues of student access to computers, databases, and networks	▲2.9	▲3.3	▲3.0	▲2.9	2.7	▲2.6	2.8	2.7
Used communications technologies (such as e-mail, networking, etc.) to increase the frequency, convenience, and/or quality of student-faculty interactions	▲2.7	▲2.9	▲2.5	▲2.5	▲2.1	▲2.0	▲1.9	2.2

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very well, 3 = moderately well, and 4 = very well.

▲This mean is statistically significantly different from that for all other types of schools combined p < .05).

Source: CAO questionnaire, question 27.

The student version of the question on student-faculty interactions asked students who used computer network services during the past term, "To what extent, if at all, do you think technologies such as e-mail and networking have increased the frequency, convenience, and/or quality of your interactions with faculty?" The students tend to be more positive on this issue than faculty or administrators. A fourth of the students (26 percent) answered "a moderate amount," and another 28 percent answered "a great deal." There were no appreciable differences by type of school, but a higher-than-average percentage of students majoring in computer science, math, or engineering (43 percent) answered "a great deal."

Students have even more positive views about how useful their ability to access information electronically has been in doing their school work. (Only those who reported that they have accessed information electronically were asked this question.) Seventy percent reported that this ability has been very useful, and another 24 percent said it has been moderately useful. There are no appreciable differences in these percentages by type of school or academic major.

BARRIERS TO INCREASED USE

Students were the only survey group asked explicitly about barriers to increased use of computer networks, such as using e-mail or online bulletin boards, transferring computer files, and accessing computerized bibliographic and full-text resources. None of the potential barriers asked about is perceived as a moderate or major barrier by more than half of the respondents (Exhibit IV-22). The largest barriers are lack of training (perceived as moderate or major by 47 percent of respondents) and lack of access to networks (46 percent). (Consistent with the relatively few public 2-year colleges with network access, students in public 2-year colleges are more likely than others to consider lack of access to be a barrier. The mean rating for this group is 2.6, compared with means of 2.3 and 2.4 for students in other types of schools.) Learning time is perceived as a moderate or major barrier by 39 percent of respondents. A third of the respondents (33 percent) rated lack of awareness and lack of interest as moderate or major barriers.

Exhibit IV-22

STUDENTS' PERCEPTIONS OF BARRIERS TO THEIR INCREASED USE OF COMPUTER NETWORKS

(Only Those Students Who Used a Computer for School Work During the Past Term)

	Mean Rating	Not a Barrier	A Minor Barrier	A Moderate Barrier	A Major Barrier
Lack of training in how to do these things	2.5	22*	30	25	22
Not having access to networks	2.4	35	17	19	27
Amount of time required to learn how to do these things	2.2	33	28	24	15
Lack of awareness that you can do these things	2.1	41	25	17	16
Your own lack of interest in doing these things	2.0	41	26	20	13

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*I.e., 22% of respondents said that lack of training in how to do these things (i.e., use e-mail or online bulletin boards, transfer computer files, access computerized bibliographic and full-text resources, etc.) is not a barrier to their increased use of networks. Item percentages may not sum to 100 because "have no idea" responses (all less than 5%) are not shown.

Source: Student questionnaire, question 49.

EXPECTATIONS FOR THE FUTURE

The vast majority of schools expect that over the next 3 years their institution's expenditures for campus network infrastructure and campus network technical support and training will increase (85 and 82 percent, respectively). Similarly, about three-fourths of schools expect that expenditures will increase for Internet/Bitnet infrastructure (79 percent) and Internet/Bitnet technical support and training (77 percent). About a third of the schools expect expenditures to increase for community network infrastructure (36 percent) and community network technical support and training (33 percent). (These are about the same percentages as those who are currently operating a community network or plan to do so within the next 3 years.) Except for the community network items (which show public/private differences), there are few appreciable differences by institutional type on these items. Where there are differences, private doctoral universities tend to be less likely than others to expect an increase.

The vast majority of CAO respondents (81 percent) also believe that computer networks have "a great deal" of potential of help meet their institution's instructional mission. Slightly fewer than half (43 percent) believe that networks have a great deal of potential to help meet the institution's community service mission. The perceived potential for electronic publishing (i.e., the public issuance of documents in electronic format) is considerably less, probably reflecting some uncertainty about exactly what this concept comprises. A fourth of the CAO respondents (25 percent) believe that electronic publishing has a great deal of potential to help meet their institution's instructional mission, and 16 percent believe it has a great deal of potential to help meet the institution's community service mission.

V. AUDIO, VIDEO, AND MULTIMEDIA INSTRUCTIONAL TECHNOLOGIES

INTRODUCTION

This chapter covers on-campus uses of audio, video, and multimedia (AVM) instructional technologies. (The use of these technologies in distance education is covered in Chapter VIII.) The definitions provided to respondents were as follows:

- **Video technologies** (carry picture and sound): Broadcast, cable, or closed-circuit television; compressed video; videocassettes; videodiscs; video projection systems.
- **Audio technologies** (carry sound only): audio cassettes, audiotapes, audio CDs, records, radio.
- **Multimedia**: Computer-mediated integration of text, audio, and/or video technologies—for example, microcomputers linked to and controlling videodisc players, CD-ROMs, video/audio projection units, or slide or video digitizers.

Questions about instructional technologies were asked in the Faculty, Student, Chief Academic Officer (CAO), and Instructional Technologies questionnaires. See Chapter II for a description of the institutional, faculty, and student samples and respondents and definitions of the various types of institutions discussed below.

USE BY FACULTY AND STUDENTS

Video Materials

About half of the faculty (54 percent) reported that during the 1993 Fall Term they used video instructional materials (defined as "video materials created specifically for instructional use, such as lectures, classroom demonstrations, etc."), and two-thirds (66 percent) have used these materials at some time in the past (Exhibit V-1). Percentages who used other video materials, such as entertainment and documentaries, are somewhat lower. Thirty-nine percent used them during the 1993 Fall Term, and half (49 percent) used them at some time in the past. Faculty in public 2-year schools are the most likely to have used video materials, and faculty in doctoral schools are the least likely to have done so. The largest differences are in Fall Term use of video instructional materials, which were used by almost three-fourths of public 2-year faculty (71 percent), compared with 56 percent of comprehensive school faculty and slightly fewer than half (43 percent) of faculty in doctoral institutions. Among the program areas, education faculty are the most likely to have used instructional video materials, and CSME faculty are the least likely to have done so. For example, 67 percent of education faculty used these materials during the Fall Term, compared with 41 percent of CSME faculty.

Forty-six percent of the faculty reported that they have videotaped public television programs (e.g., PBS) for use as an instructional tool in a higher education for-credit course, and 28 percent have done so in the past 12 months. Taping public television programs is most common among public 2-year faculty (56 percent have done so at some time in the past) and among those in education (66 percent). It is least common among faculty at doctoral institutions (35 percent) and those in health sciences (35 percent), business (32 percent), and CSME (27 percent).

Exhibit V-1

PERCENTAGE OF FACULTY WHO USED VIDEO MATERIALS AS AN INSTRUCTIONAL TOOL IN A FOR-CREDIT COURSE, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	All Faculty[a]
Video instructional materials (video materials created specifically for instructional use, such as lectures, classroom demonstrations, etc.)				
During the 1993 Fall Term	▲43*	56	▲71	54
At some time in the past	▲58	67	▲77	66
Other video materials (entertainment, documentaries, etc.)				
During the 1993 Fall Term	▲30	39	▲46	39
At some time in the past	▲40	50	▲56	49

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*I.e., 43% of faculty in doctoral institutions reported that they used video instructional materials as an instructional tool in a for-credit course during the 1993 Fall Term.

▲This percentage is statistically significantly different from that for all other types of faculty combined ($p < .05$).

[a] Includes faculty in liberal arts colleges, which comprise too small a sample to report separately.

Source: Faculty questionnaire, question 22.

Among students, 57 percent reported that during the last term they took at least one course in which they watched video materials created specifically for instructional use, and the same percentage said they took a course in which they watched other kinds of video materials. There are no appreciable differences by type of school in percentages who watched video instructional materials, but the differences are statistically significant for other types of video (Exhibit V-2). Here, percentages range from a high of 64 percent among students at comprehensive universities to a low of 53 percent at public 2-year and other kinds of schools.

Exhibit V-2

PERCENTAGE OF STUDENTS WHO TOOK ONE OR MORE COURSES DURING THE PAST TERM IN WHICH THEY WATCHED VIDEO MATERIALS, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	Other	All Students
Video materials created specifically for instructional use	57*	58	58	53	57
Other video materials	57	▲64	53	53	57

---

*I.e., 57% of students in doctoral universities reported that they took at least one course during the past term in which they watched video materials created specifically for instructional use.

▲This percentage is statistically significantly different from that for all other types of students combined ($p < .05$).

Source: Student questionnaire, questions 63 and 69.

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There are no appreciable differences among students by academic major, but among students in 4-year schools, graduate students are less likely than undergraduates to have watched either kinds of video (Exhibit V-3). For example, 40 percent of graduate students watched instructional video materials, compared with 57 to 70 percent of undergraduates.

Exhibit V-3

PERCENTAGE OF STUDENTS WHO TOOK ONE OR MORE COURSES DURING THE PAST TERM IN WHICH THEY WATCHED VIDEO MATERIALS, BY ACADEMIC YEAR

(Students in 4-Year Schools Only)

	Freshman	Sophomore	Junior	Senior	Grad Student	All Students in 4-Year Schools
Video materials created specifically for instructional use	57*	▲70	66	59	▲40	58
Other video materials	58	67	67	67	▲46	61

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*I.e., 57% of freshman students in 4-year schools reported that they took at least one course during the past term in which they watched video materials created specifically for instructional use.

▲This percentage is statistically significantly different from that for all other types of students combined ($p < .05$).

Source: Student questionnaire, questions 63 and 69.

Results of the CAO survey seem to be generally consistent with those of the faculty and student surveys in finding relatively widespread faculty and student use of video materials, although differences in response categories (yes/no for faculty and students vs. percentage ranges for the CAO respondents) and units of analysis (schools vs. individuals) make direct comparisons problematic. A third of the CAO respondents (34 percent) estimated that more than 50 percent of their faculty used video materials in 1993 Fall Term courses, and 36 percent estimated that no more than 25 percent of the faculty did so (Exhibit V-4).

Like the faculty results, the CAO results show that doctoral schools are the least likely to have widespread use of video materials. For example, 19 percent of the public doctoral CAO respondents and 29 percent of those in private doctoral schools estimated that none or fewer than 10 percent of the faculty use video materials, compared with 12 percent overall.

Exhibit V-4

ESTIMATED PERCENTAGE OF FACULTY WHO USED VIDEO TECHNOLOGIES IN ANY OF THEIR 1993 FALL TERM COURSES, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
None	▲0*	▲0	▲0	▲0	1	1	▲8	1
Fewer than 10%	▲19	▲29	13	▲7	13	9	▲5	11
10% to 25%	▲33	▲37	25	27	25	20	▲16	24
26% to 50%	▲17	22	33	34	30	25	29	28
More than 50%	▲21	▲8	▲23	29	30	▲45	▲42	34
Have no idea	▲10	4	▲5	4	1	▲0	▲0	2

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*I.e., 0% of public doctoral respondents reported than none of their faculty used video technologies.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: CAO questionnaire, question 12c.

Audio Materials

Moderate percentages of faculty and students use audio materials. During the 1993 Fall Term, a third of the faculty (32 percent) used audio instructional materials ("audio materials created specifically for instructional use, such as lectures or other classroom presentations, language tapes, etc."), and slightly fewer than half (46 percent) used them at some time in the past (Exhibit V-5). A fourth (26 percent) used other audio materials (music, entertainment, news broadcasts, documentaries, etc.) during the 1993 Fall Term; 36 percent used them at some time in the past. As with video materials, self-reported faculty use of audio materials is highest at public 2-year schools and lowest at doctoral schools. For example, the percentage who used audio instructional materials during the Fall Term ranged from 44 percent of public 2-year faculty to 23 percent of doctoral school faculty. Differences among the program areas are similar to the differences reported above with regard to video materials.

Exhibit V-5

PERCENTAGE OF FACULTY WHO USED AUDIO MATERIALS AS AN INSTRUCTIONAL TOOL IN A FOR-CREDIT COURSE, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	All Faculty[a]
Audio instructional materials (audio materials created specifically for instructional use, such as lectures or other classroom presentations, language tapes, etc.)				
During the 1993 Fall Term	▲23*	33	▲44	32
At some time in the past	▲34	47	▲60	46
Other audio (music, entertainment, news broadcasts, documentaries, etc.)				
During the 1993 Fall Term	▲19	27	▲33	26
At some time in the past	▲27	▲38	▲44	36

---

*I.e., 23% of faculty in doctoral institutions reported that they used audio instructional materials as an instructional tool in a for-credit course during the 1993 Fall Term.

▲This percentage is statistically significantly different from that for all other types of faculty combined ($p < .05$).

[a] Includes faculty in liberal arts colleges, which comprise too small a sample to report separately.

Source: Faculty questionnaire, question 22.

The student survey found that during the most recent school term, 31 percent of students listened to audio materials created specifically for instructional use, and 42 percent listened to other kinds of audio materials as part of a course they were taking (Exhibit V-6). Consistent with faculty responses, students in public 2-year schools are more likely than those in other kinds of schools to have listened to audio instructional materials (39 percent vs. 26 to 29 percent). However, the percentage who reported listening to other audio materials is about the same in the public 2-year schools as in doctoral and comprehensive schools; on this measure, it is the "other" schools that are anomalous. Among students in 4-year schools, graduate students were less likely than undergraduates to have listened to either audio instructional materials (19 percent vs. an average of 30 percent) or other audio recordings (30 percent vs. an average of 47 percent).

Exhibit V-6

PERCENTAGE OF STUDENTS WHO TOOK ONE OR MORE COURSES DURING THE PAST TERM IN WHICH THEY LISTENED TO AUDIO MATERIALS, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	Other	All Students
Audio materials created specifically for instructional use	26*	27	▲39	29	30
Other audio materials	44	44	42	▲33	42

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*I.e., 26% of students in doctoral universities reported that they took at least one course during the past term in which they listened to audio materials created specifically for instructional use.

▲This percentage is statistically significantly different from that for all other types of students combined (p < .05).

Source: Student questionnaire, questions 63 and 69.

Most CAO respondents (60 percent) estimated that no more than a fourth of the faculty used audio technologies in any of their 1993 Fall Term courses (Exhibit V-7). However, 16 percent estimated that more than half of their faculty used audio technologies. Consistent with the faculty responses, CAO responses suggest that faculty in public and, especially, private doctoral institutions tend to be the least likely to use audio technologies. For example, 38 percent and 51 percent of CAO respondents at these two types of institutions, respectively, estimated that none or fewer than 10 percent of their faculty used audio technologies, compared with 31 percent overall.

Exhibit V-7

ESTIMATED PERCENTAGE OF FACULTY WHO USED AUDIO TECHNOLOGIES IN ANY OF THEIR 1993 FALL TERM COURSES, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
None	▲0*	▲0	▲0	3	▲0	2	▲10	2
Fewer than 10%	▲38	▲51	▲22	▲17	31	31	23	29
10% to 25%	▲18	24	▲36	▲36	29	26	22	29
26% to 50%	18	▲12	25	22	21	21	21	21
More than 50%	▲8	▲2	11	18	16	18	21	16
Have no idea	▲18	▲12	6	4	4	▲3	2	4

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*I.e., 0% of public doctoral respondents reported than none of their faculty used audio technologies.

▲This percentage is statistically significantly different from that for all other types of schools combined (p < .05).

Source: CAO questionnaire, question 12b.

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Multimedia Materials

According to both faculty and CAO (but not student) reports, instructional use of multimedia materials is much less common than is use of audio or video materials. Overall, 15 percent of faculty reported that they used multimedia materials (i.e., computer-mediated integration of text, audio, and/or video) in classroom presentations during the 1993 Fall Term, and 9 percent reported that they used multimedia materials for self-paced individualized instruction (Exhibit V-8). As with use of audio and video materials, faculty at public 2-year schools were more likely than those at doctoral and comprehensive schools to report classroom use of multimedia. For example, 21 percent of public 2-year schools faculty vs. 11 and 14 percent of doctoral and comprehensive school faculty, respectively, reported classroom uses of multimedia during the 1993 Fall Term. Among the program areas, education faculty once again are the most likely to have used these materials in classroom presentations (21 percent did so during the Fall Term). Humanities and social sciences faculty were the least likely to use multimedia materials in the classroom (9 and 10 percent, respectively, did so during the Fall Term). There were no appreciable differences among program areas in use of self-paced multimedia materials.

Exhibit V-8

PERCENTAGE OF FACULTY WHO USED MULTIMEDIA MATERIALS AS AN INSTRUCTIONAL TOOL IN A FOR-CREDIT COURSE, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	All Faculty[a]
Multimedia materials (computer-mediated integration of text, audio, and/or video) used in classroom presentations				
During the 1993 Fall Term	▲11*	14	▲21	15
At some time in the past	▲15	21	▲27	20
Multimedia materials used for self-paced individualized instruction				
During the 1993 Fall Term	8	▲7	▲16	9
At some time in the past	▲12	15	▲22	15

---

*I.e., 11% of faculty in doctoral institutions reported that they used multimedia instructional materials as an instructional tool in a for-credit course during the 1993 Fall Term.

▲This percentage is statistically significantly different from that for all other types of faculty combined ($p < .05$).

[a] Includes faculty in liberal arts colleges, which comprise too small a sample to report separately.

Source: Faculty questionnaire, question 22.

In contrast to the low level of use reported by faculty, a full 40 percent of students reported that during the last term an instructor used multimedia materials in classroom presentations (Exhibit V-9). Percentages range from a high of 48 percent among students at comprehensive universities to a low of 30 percent at public 2-year schools. A much smaller percentage of students—15 percent—reported that they had used multimedia materials in a self-paced individualized instruction program. There are no appreciable differences in multimedia use by academic year or academic major.

Exhibit V-9

PERCENTAGE OF STUDENTS WHO USED MULTIMEDIA MATERIALS IN ONE OR MORE COURSES DURING THE PAST TERM, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	Other	All Students
Instructor used multimedia materials in classroom presentation(s)	44*	▲48	▲30	33	39
Student used multimedia materials in a self-paced individualized instruction program	15	17	15	13	15

*I.e., 44% of students in doctoral universities reported that they took at least one course during the past term in which an instructor used multimedia materials in a classroom presentation.

▲This percentage is statistically significantly different from that for all other types of students combined (p < .05).

Source: Student questionnaire, questions 63 and 69.

As did the faculty, CAO respondents estimated that faculty multimedia use is quite low. Three-quarters of CAO respondents estimated that no more than a fourth of the faculty used multimedia technologies in any of their 1993 Fall Term courses, and only 4 percent estimated that more than half of their faculty used them (Exhibit V-10). According to these estimates, faculty in private doctoral institutions were least likely to be users (84 percent estimated that none or fewer than 10 percent were multimedia users, vs. 65 percent overall). The very high percentage (42 percent) of private 2-year respondents who reported that none of their faculty used these materials is also noteworthy. Reasons for these seemingly anomalous findings across the various sets of respondents may be similar to those discussed with regard to video technologies. More generally, the lack of consistency, both across and within sets of respondents, suggests that these questions may have been difficult for many respondents to answer (difficulties of recall, estimation, definitions of terms, and so on), so that the responses may not be as reliable as one would wish.

Exhibit V-10

ESTIMATED PERCENTAGE OF FACULTY WHO USED MULTIMEDIA TECHNOLOGIES IN ANY OF THEIR 1993 FALL TERM COURSES, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
None	▲0*	▲4	▲3	▲3	14	13	▲42	12
Fewer than 10%	▲63	▲80	56	52	51	54	▲21	53
10% to 25%	18	▲8	▲29	24	22	20	23	22
26% to 50%	4	4	4	▲12	6	5	9	6
More than 50%	3	▲0	2	3	4	6	2	4
Have no idea	▲11	4	6	6	4	▲1	2	3

*I.e., 0% of public doctoral respondents reported than none of their faculty used multimedia technologies.

▲This percentage is statistically significantly different from that for all other types of schools combined (p < .05).

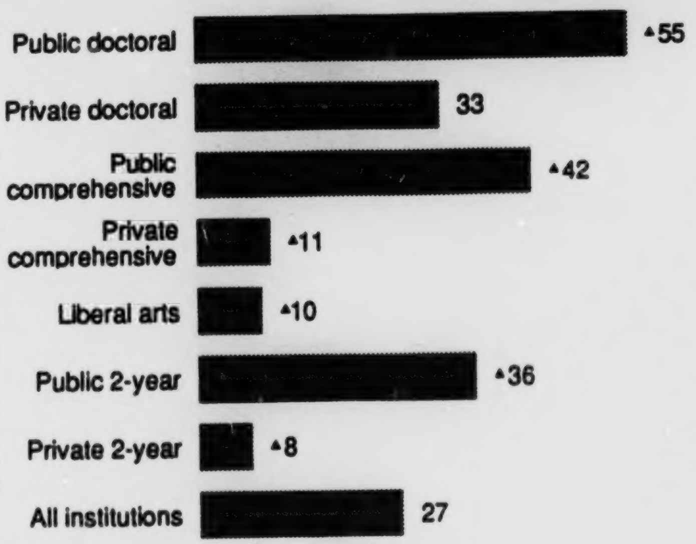
Source: CAO questionnaire, question 12d.

VIDEO COURSES

During the 1993 Fall Term, a fourth of institutions (27 percent) offered on-campus courses in which the instruction was delivered primarily through videotape or live video feed. Public institutions were more likely to offer these kinds of courses than were their private counterparts (Exhibit V-11). For example, 55 percent of the public doctorals offered these courses, compared with 33 percent of the private doctorals.

Exhibit V-11

PERCENTAGE OF INSTITUTIONS THAT OFFERED ON-CAMPUS COURSES IN WHICH THE INSTRUCTION WAS DELIVERED PRIMARILY THROUGH VIDEOTAPE OR LIVE VIDEO FEED, BY TYPE OF INSTITUTION



▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Instructional Technologies questionnaire, question 17.

The Instructional Technologies questionnaire asked about the kinds of video courses that were offered, differentiating between courses that originated at the institution vs. outside the institution and between live video feed, low-production-effort prepackaged videotape courses, and high-production-effort videotape courses (see Exhibit V-12). Similar percentages of institutions (about 10 percent) reported that they offered each of these six types of courses. Among institutions that offered each kind of course, from one to five courses typically were offered. The patterns of differences by institutional type are parallel to the differences shown on the overall video course question (Exhibit V-11, above).

Exhibit V-12

PERCENTAGE OF INSTITUTIONS THAT OFFERED VARIOUS TYPES OF VIDEO COURSES, BY NUMBER OF COURSES OF EACH TYPE OFFERED

Courses originating at the institution	None	1 to 5	6 to 10	More than 10
Live video feed of an entire "regular" (on-campus) course	88*	8	2	3
Prepackaged videotape course involving relatively little production effort (for example, a videotaped recording of a lecture course)	87	7	3	2
Prepackaged videotape course involving a significant investment in production (for example, involving narrated documentary, simulations, graphics, etc.)	91	4	3	2
Courses originating outside the institution				
Live video feed of an entire "regular" (on-campus) course	90	7	2	1
Prepackaged videotape course involving relatively little production effort	90	6	1	2
Prepackaged videotape course involving a significant investment in production	90	5	2	2

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*I.e., 88% of respondents reported that they offered no live video feed courses that originated at their own institution.

Source: Instructional Technologies questionnaire, questions 18 and 19.

COMPUTER-INTEGRATED MULTIMEDIA COURSES

On-campus courses in which the instruction was delivered **primarily** through computer-integrated multimedia courseware are rare. Only 12 percent of institutions offered any such courses during the 1993 Fall Term. Of these, almost all (93 percent) offered multimedia courses that originated at that institution, while about a fourth (27 percent) offered multimedia courses that originated elsewhere. In most institutions that offered these courses, no more than five such courses were offered. By type of institution, the percentages that offered these courses ranged from 1 percent of private 2-year schools to 23 percent of public doctoral schools; the other types of schools did not differ significantly from the overall percentage.

FACULTY DEVELOPMENT OF AVM INSTRUCTIONAL MATERIALS

Almost 4 in 10 faculty (37 percent) reported that, at some time in the past, they have developed video instructional materials for use in higher education, and 22 percent reported having done so in the past 12 months. Fewer reported having developed audio instructional materials (25 percent ever; 12 percent in the past 12 months), and fewer still developed multimedia instructional materials (11 percent ever; 7 percent in the past 12 months). Differences by institutional type are small. The largest differences are with regard to having ever developed video materials. Here, the percentages range from a high of 44 percent of faculty at public 2-year schools to 39 percent of those at comprehensive schools and 32 percent of those at doctoral schools. By program area, education faculty are the most likely to have developed AVM materials, while CSME, business, and social sciences faculty are the least likely to have done so. For instance, 49 percent of education faculty reported that they have developed video materials at some time in the past, compared with 27 and 29 percent of CSME and social sciences faculty, respectively, and only 14 percent of business faculty.

Among CAO respondents, about 61 percent reported that at least some of their institution's faculty developed AVM instructional materials within the past 12 months. The percentages vary greatly by type of school, from only about a fourth of private 2-year schools to almost all public doctoral schools. However, this finding is largely a function of the size of the various kinds of schools—the larger the school, the more likely it is that someone engaged in any given activity; and, as noted in Chapter I, liberal arts and private 2-year schools (those with the lowest percentages on this item) are on average considerably smaller than the other kinds of schools, whereas public doctoral schools are by far the largest.

FACULTY TRAINING

As shown in Exhibit V-13, 28 percent of faculty reported that they have received training in how to use AVM materials in their courses, and 18 percent have received this training in the past 3 years. Almost a fifth (18 percent) reported that they have received training in how to produce these materials (10 percent in the past 3 years). There are only small differences by institutional type with regard to production, but the differences with regard to use are sizable. For example, only 15 percent of doctoral school faculty have received any training in use of these materials, compared with 34 percent of faculty at comprehensive schools, and 42 percent of those at public 2-year schools. Differences by program area parallel the differences reported above with regard to AVM use.

Exhibit V-13

PERCENTAGE OF FACULTY WHO HAVE RECEIVED TRAINING IN THE USE AND PRODUCTION OF AUDIO, VIDEO, AND MULTIMEDIA MATERIALS, BY TYPE OF INSTITUTION

	Doctoral	Comprehensive	Public 2-Year	All Faculty[a]
Received training in how to use audio, video, or multimedia materials in your courses				
During the past 3 years	▲9*	21	▲29	18
At some time in the past	▲15	▲34	▲42	28
Received training in production of audio, video, or multimedia materials				
During the 1993 Fall Term	▲8	11	13	10
At some time in the past	▲13	22	22	18

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*I.e., 9% of faculty in doctoral institutions reported that they received training in how to use AVM materials in their courses during the past 3 years.

▲This percentage is statistically significantly different from that for all other types of faculty combined ($p < .05$).

[a] Includes faculty in liberal arts colleges, which comprise too small a sample to report separately.

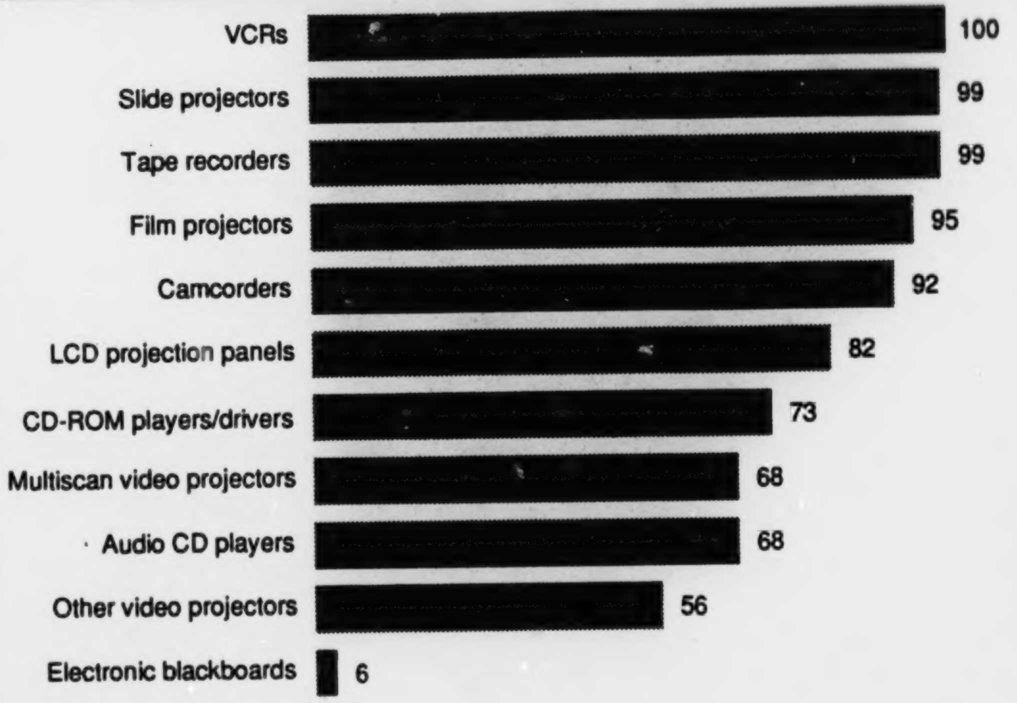
Source: Faculty questionnaire, question 26.

AVAILABILITY OF AVM EQUIPMENT

According to the Instructional Technology questionnaire respondents, all institutions maintain VCRs, and 90 percent or more maintain camcorders, slide and film projectors, and tape recorders (Exhibit V-14). LCD projection panels also are very common, being maintained by 82 percent of institutions. CD-ROM players/drivers and audio CD players are maintained by about 70 percent of institutions. Multiscan and other kinds of video projectors are less common but nevertheless are maintained by more than half of the institutions (68 percent have multiscan projectors and 56 percent have other kinds of video projectors). The only kind of equipment listed that is rarely available is an electronic blackboard, which only 6 percent of institutions reported maintaining.

Exhibit V-14

PERCENTAGE OF INSTITUTIONS THAT MAINTAIN VARIOUS TYPES OF AUDIO, VIDEO, AND MULTIMEDIA EQUIPMENT



Source: Instructional Technologies questionnaire, question 1.

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Almost all institutions, of all types, have VCRs, slide projectors, tape recorders, and film projectors (Exhibit V-15). On other kinds of equipment, private 2-year school percentages are considerably lower than the overall percentages. Among the other types of schools, the largest differences are in the availability of multiscan video projectors (ranging from 63 percent of liberal arts colleges to 92 percent of the public doctorals) and other video projectors (ranging from 45 percent of liberal arts colleges to 83 percent of the public doctorals).

Essentially all institutions (98 percent) reported that the equipment listed in Exhibits V-14 and V-15 is usually or almost always available to faculty when they request it, for either check-out or on-site use, and about three-quarters (72 percent) indicated that it is usually or almost always available for students. Fourteen percent reported that most equipment is not available for student use at all. There are no large differences in availability by type of institution.

Exhibit V-15

PERCENTAGE OF INSTITUTIONS THAT MAINTAIN VARIOUS TYPES OF AUDIO, VIDEO, AND MULTIMEDIA EQUIPMENT, BY TYPE OF INSTITUTION

(Listed in Descending Order of "All Institutions" Percentages)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
VCRs	100*	100	100	100	100	100	100	100
Slide projectors	▲100	97	▲100	99	▲100	98	▲94	99
Tape recorders	97	97	99	99	99	99	▲92	99
Film projectors	96	97	▲99	▲99	96	94	▲83	95
Camcorders	92	▲74	▲96	95	94	93	▲76	92
LCD projection panels	▲94	87	▲88	86	78	84	▲50	82
CD-ROM players/drivers	75	64	78	75	74	73	▲61	73
Multiscan video projectors	▲92	▲85	▲80	▲76	63	67	▲32	68
Audio CD players	▲77	69	73	▲83	69	64	▲46	68
Other video projectors	▲83	▲69	▲78	57	▲45	56	▲20	56
Electronic blackboards	▲14	10	7	4	4	8	▲0	6

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*I.e., 100% of public doctoral respondents reported that VCRs were maintained for faculty or student use.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Instructional Technologies questionnaire, question 1.

In contrast to the widespread availability of the equipment listed in Exhibits V-14 and V-15, installation of AVM equipment in classrooms is fairly uncommon (Exhibit V-16). For all types of equipment but one (electronic blackboards), most schools have at least one classroom in which the equipment is installed, but the vast majority of schools have the equipment in fewer than 5 percent of their classrooms. The single exception is that about half of the schools (53 percent) have installed film or slide projection screens in more than half of their classrooms.

Exhibit V-16

PERCENTAGE OF INSTITUTIONS THAT HAVE INSTALLED AVM EQUIPMENT IN CLASSROOMS, BY THE PROPORTION OF CLASSROOMS SO EQUIPPED

	None	Fewer than 5%	5% to 10%	11% to 25%	26% to 50%	More than 50%	Have No Idea
Film/slide projection screen	12*	10	6	7	6	53	1
Video monitor	20	25	14	11	9	17	1
VCR	22	27	14	10	8	13	1
Sound amplification system	28	43	18	5	1	1	1
Cable television outlet	41	23	7	6	4	14	2
Film/slide projection booth	41	41	10	4	1	1	1
Closed-circuit TV outlet (not for cable TV)	45	18	6	5	4	15	3
Electronic blackboard	89	7	1	<1	<1	<1	2

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*I.e., 12% of respondents reported that film/slide projection screens were installed in none of their classrooms.

Source: Instructional Technologies questionnaire, question 4.

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For some of these items, availability varies considerably by type of institution (Exhibit V-17) and typically seems to be related to the size of the institution. In most cases, higher-than-average percentages of public doctoral schools have the equipment, and much lower-than-average percentages of private 2-year schools do so. The largest range of availability is for film or slide projection booths—from 19 percent of private 2-year schools to 91 percent of the public doctorals.

Exhibit V-17

PERCENTAGE OF INSTITUTIONS IN WHICH EACH LISTED ITEM HAS BEEN INSTALLED IN AT LEAST ONE CLASSROOM, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Institutions
Film/slide projection screen	91*	▲98	94	91	89	84	▲66	87
Video monitor	▲92	▲93	89	78	78	80	▲49	80
VCR	▲90	83	▲84	75	76	76	▲60	77
Sound amplification system	▲94	▲95	▲90	▲83	68	67	▲25	72
Cable television outlet	59	49	▲72	62	57	56	▲31	57
Film/slide projection booth	▲91	▲88	▲75	71	60	▲45	▲19	57
Closed-circuit TV outlet (not for cable TV)	▲78	61	▲60	49	▲37	▲60	▲22	52
Electronic blackboard	▲21	15	11	9	6	9	▲4	9

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*I.e., 91% of public doctoral respondents reported that film/slide projection screens are installed in at least one of their classrooms.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Instructional Technologies questionnaire, question 4.

AVM INSTRUCTIONAL TECHNOLOGY FACILITIES

As presented in Exhibit V-18, most institutions have audiotape-based (72 percent) and videotape-based (66 percent) learning centers or workstations, and slightly less than half have multimedia workstations (47 percent), classrooms designed and equipped for origination of live video (46 percent) and classrooms especially designed to provide for the computer-controlled integration of technologies such as videodisc players, VCRs, and projection equipment (44 percent). On average, institutions have 26 audiotape workstations, 14 videotape workstations, 2 live-video-origination classrooms, and 4 integrated-media classrooms.

Again, the larger institutions tend to be more likely to have these facilities, and private 2-year colleges are much less likely than other types of schools to have them. There is relatively little variation, however, in the percentages of schools that have multimedia workstations. Except for private 2-year schools, that range is only 14 points—from 41 percent of the private comprehensives to 55 percent of the public doctorals.

Exhibit V-18

PERCENTAGE OF INSTITUTIONS THAT HAVE EACH LISTED FACILITY, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Audiotape-based learning center or workstations, such as a language lab (1)	▲94*	78	▲88	77	67	69	▲44	72
Videotape-based learning center or workstations (1)	▲82	73	▲73	▲72	▲50	▲71	▲44	66
Workstations that are used (entirely or in part) for self-paced individualized multimedia instruction (2)	55	51	45	41	44	▲52	▲32	47
Classroom(s) designed and equipped for origination of live video programs (1)	▲82	▲61	▲75	41	▲30	47	▲10	46
Classroom(s) especially designed to provide for the **computer-controlled integration of technologies** such as videodisc players, VCRs, and projection equipment[a] (1)	▲81	▲72	▲56	51	▲37	▲41	▲13	▲44

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*I.e., 94% of public doctoral respondents reported that their institution has one or more audiotape-based learning centers or workstations.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

[a] Excluding computer labs, language labs, or rooms with other kinds of individual workstations.

Sources: (1) Instructional Technologies questionnaire, questions 5, 6, and 7.
(2) Computer questionnaire, question 14.

The student and faculty surveys found that 34 percent of the students and 12 percent of the faculty had class sessions in a "high tech" computer-controlled classroom during the past term or the 1993 Fall Term. Seventeen percent of the faculty reported that they have used one of these classrooms at some time in the past. There are only small differences by institutional type in these percentages.

CENTRAL COLLECTIONS OF AVM SOFTWARE

Almost all institutions (92 percent) have at least one centrally administered collection of AVM software. Across institutional types, the percentages that have such collections range from 85 percent of private doctoral and liberal arts institutions to 97 percent of public 2-year institutions. Sixty-five percent of institutions house the collections in their libraries, and 42 percent house them in media resources center(s). (Some schools have collections in both locations.) As shown in Exhibit V-19, schools are considerably more likely to have most kinds of software available for use on-site than for loan. With the exception of NPR/APR audio materials, the range for on-site use is 60 percent (for films) to 78 percent (for microfiche or microfilm). The comparable range for availability for loan is 3 percent (for electronic materials that integrate text and visual images, such as CD-ROM-based encyclopedias) to 51 percent (for records, audiotapes, and/or audio CDs).

Exhibit V-19

AVAILABILITY OF AUDIO, VIDEO, AND MULTIMEDIA SOFTWARE TO STUDENTS AT INSTITUTIONS WITH CENTRALLY ADMINISTERED SOFTWARE COLLECTIONS

(Listed in Descending Order of On-Site Availability)

	Available to Students for Loan	Available to Students for Use On-Site
Microfiche or microfilm	7*	78
Videotapes	49	74
Other CD-ROMs (text-only CDs, databases, etc.)	3	71
Other computer software	12	70
Records, audiotapes, and/or audio CDs	51	70
Video materials produced by public television (PBS Video, Annenberg/CPB Project telecourses, etc.)	32	66
Electronic materials that integrate text and visual images, such as a CD-ROM-based encyclopedia	3	61
Films	23	60
Audio materials produced by National Public Radio (NPR) or American Public Radio (APR)	14	29

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*I.e., 7% of respondents reported that microfiche or microfilm is available to students for loan.

Source: Instructional Technologies questionnaire, question 9.

VIDEO RECEPTION EQUIPMENT

The only kind of video reception equipment that is currently typical on campuses is a satellite dish, which three-quarters (75 percent) of institutions reported having (Exhibit V-20). Fewer than a third of institutions have a connection to a fiber optic network (28 percent), ITFS reception equipment (24 percent), or "wireless cable" reception equipment (6 percent). However, availability is expected to increase, especially for fiber optic network connections—71 percent expect these connections to be in place within the next 3 years.

There are very large differences by institutional type in the availability of video reception equipment. Generally, the public schools are more likely than the private schools to have such equipment and to expect to have it in the future, and the public doctorals are the most likely to have it. For example, 90 percent or more of the public doctoral and public comprehensive schools expect to have fiber optic networks in the next 3 years, compared with 67 to 72 percent of their private counterparts. Private 2-year schools once again are by far the least likely to have this equipment; 62 percent have none of the listed video reception equipment currently.

Exhibit V-20

CURRENT AND FUTURE AVAILABILITY OF VIDEO RECEPTION EQUIPMENT, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Satellite dish								
Currently available	▴99*	77	▴96	▴65	▴52	▴89	▴25	75
Likely in 3 years	▴100	85	▴99	76	▴65	▴93	▴35	82
Connection to fiber optic network								
Currently available	▴64	33	▴44	26	▴20	25	▴6	28
Likely in 3 years	▴96	72	▴90	67	▴57	76	▴37	71
ITFS reception equipment								
Currently available	▴54	33	▴36	▴14	18	23	▴5	24
Likely in 3 years	▴61	46	▴50	37	▴31	42	▴16	39
"Wireless cable" reception equipment								
Currently available	▴15	10	11	5	▴2	7	▴1	6
Likely in 3 years	▴36	21	▴33	21	19	22	▴5	23
None of the above								
Currently available	▴0	13	▴1	18	▴28	▴5	▴58	14
Likely in 3 years	▴0	10	▴1	14	▴17	▴4	▴50	10

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*I.e., 99% of public doctoral respondents reported that the institution currently has at least one satellite dish.

▴This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Instructional Technologies questionnaire, questions 10, 11, and 12.

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As shown in Exhibit V-21, by far the most common kind of satellite dish is a dual C/Ku band dish, which 57 percent of schools have. The next most common kind is a rotatable C-band (28 percent). Each of the other kinds of satellite dishes are located at fewer than 15 percent of schools. For each kind of dish, the typical number on any given campus was one.

Exhibit V-21

CURRENT AVAILABILITY OF SATELLITE RECEPTION DISHES

(Listed in Descending Order of Availability)

Type of Satellite Dish	Percentage of Institutions That Have One or More	Number of Dishes Per Institution		
		Range	Mode	Mean
Dual C/Ku band	57	1-13	1	1.5
Rotatable C-band	28	1-9	1	1.4
Rotatable Ku-band	14	1-3	1	1.3
Fixed (non-rotatable) C-band	12	1-8	1	1.5
Fixed (non-rotatable) Ku-band	10	1-6	1	1.2
Other kind of satellite dish	7	1-3	1	1.2
Very Small Aperture Terminal (VSAT)	3	1-5	1	1.2

Source: Instructional Technologies questionnaire, question 10.

Cable Television Outlets in Dormitories

Among the 61 percent of schools that have on-campus institutionally owned residences, another kind of video reception capability that is common is a cable television outlet. Slightly over half (55 percent) of these schools reported that more than 90 percent of the residences have cable television outlets. Only 15 percent do not have cable outlets in any of the residences. Similarly, the student survey found that 54 percent of respondents who lived on campus had a cable television outlet in their room at school.

BROADCASTING AND CABLE NETWORK OPERATIONS

Four in 10 institutions (40 percent) reported that they operate a closed-circuit video network or cable system within their institution. Almost 8 in 10 public doctoral institutions (78 percent) reported that they operate such a network/system, by far the highest percentage among the seven types of institutions. The lowest percentages are at liberal arts colleges (24 percent) and private 2-year schools (12 percent). Percentages at the four other types of schools range between 41 and 53 percent.

Almost half (45 percent) also reported that their institution has a license to operate a television and/or radio station.

- The most common are student-run noncommercial radio stations, operated by about a third (31 percent) of the institutions. Four-year schools are much more likely to operate these stations than are 2-year schools: about half (49 to 51 percent) of the comprehensive and doctoral schools have student-run noncommercial stations, compared with 38 percent of liberal arts colleges and only 8 to 15 percent of the 2-year schools.
- Twelve percent of schools reported that they operate a public/noncommercial television station. The Corporation for Public Broadcasting actually supports televisions stations licensed to 59 institutions of higher education, or only about 2 percent of all institutions. As there are almost no full-power non-commercial television stations that are not supported by CPB, the percentage of institutions reporting operations of a noncommercial television station in this study would appear to be too high. One possible explanation for the discrepancy is that some institutions may have reported low-power or ITFS (instructional fixed television service) television stations rather than full-power stations.
- Ten percent of schools reported that they operate a (not student-run) public/noncommercial radio station. Unlike the percentage regarding television stations, this percentage is quite close to the 8 percent of schools that actually have CPB-supported radio stations. Public radio stations are much more likely to be operated by public doctoral schools than by other schools—51 percent of the former operate these stations, compared with fewer than a fourth of any of the other types of schools (from 2 percent of private 2-year schools to 21 percent of public comprehensives).
- Four percent operate a student-run commercial radio station, 1 percent operate a commercial television station, and 2 percent operate a (not student-run) commercial radio station.

AVM PRODUCTION

Audiotaping and Videotaping Classes

Six in 10 institutions (59 percent) audiotape or videotape at least some on-campus classes conducted by their faculty. This practice is least common at private 2-year schools (45 percent) and most common at the public doctorals (82 percent) and private doctorals (87 percent). Between the two extremes are the public 2-year schools (53 percent), liberal arts colleges (59 percent), private comprehensives (64 percent), and public comprehensives (65 percent).

The most common reasons for audiotaping classes are as an accommodation to students with disabilities or to students generally—25 percent and 22 percent, respectively, selected these reasons (Exhibit V-22). The most common reasons for videotaping classes are as an accommodation for students generally (37 percent) and for faculty training or professional development (29 percent).

Exhibit V-22

REASONS FOR AUDIOTAPING AND VIDEOTAPING ON-CAMPUS CLASSES

(Listed in Descending Order of Reasons for Audiotaping)

	Audiotape	Videotape
As an accommodation to students with disabilities	25*	18
As an accommodation to students generally	22	37
For archival purposes	11	21
For faculty training or professional development	8	29
To provide without charge to other institutions/campuses	1	5
To sell to cable channel(s), other institutions, etc.	<1	2

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*I.e., 25% of respondents reported that their institutions audiotape classes as an accommodation to students with disabilities.

Source: Instructional Technologies questionnaire, question 21.

As reported by the CAO respondents, most schools that audio- or videotape classes have no policy regarding the use or repurposing of the tapes (45 percent) or their policy varies by the situation and/or the faculty member (20 percent). Among the various policies listed, the most common is that the institution retains all rights to the tapes (21 percent); 8 percent reported that rights are shared with the taped faculty member(s), 5 percent said faculty who are taped retain all rights, and 1 percent said that the institution retains all rights but distributes royalties.

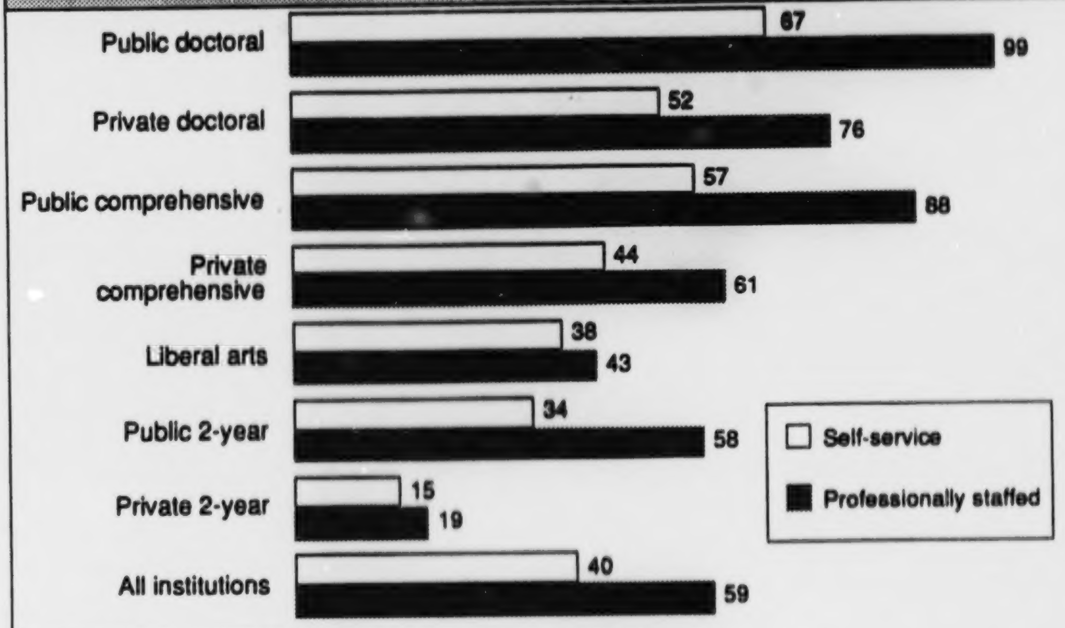
Production Facilities

Most institutions (59 percent) have professionally staffed facilities for production or post-production of audio, video, and/or multimedia materials, and 40 percent have self-service facilities (Exhibit V-23). Public institutions are more likely than their private counterparts to have both kinds of facilities. For example, essentially all (99 percent) of the public doctorals have professionally staffed facilities, compared with three-fourths (76 percent) of the private doctorals, and the comparable percentages for public and private comprehensives are 88 and 61 percent.

The most common kinds of materials that were professionally produced by institutions during the past 12 months were higher education video instructional materials and video materials for use only by the institution, produced by 49 and 53 percent of institutions, respectively (Exhibit V-24). (Note that these categories are **not** mutually exclusive; in fact, probably they largely overlap.) Professionally produced audio and multimedia materials also were likely to be produced for higher education instructional purposes and for use only within the institution. Few schools produced materials (especially audio and multimedia materials) for sale to outsiders.

Exhibit V-23

PERCENTAGE OF INSTITUTIONS THAT HAVE AUDIO, VIDEO, OR MULTIMEDIA PRODUCTION FACILITIES, BY TYPE OF INSTITUTION



Source: Instructional Technologies questionnaire, questions 22 and 23.

Exhibit V-24

PERCENTAGE OF INSTITUTIONS THAT PROFESSIONALLY PRODUCED VARIOUS KINDS OF AUDIO, VIDEO, AND MULTIMEDIA MATERIALS DURING THE PAST 12 MONTHS

	Audio Materials	Video Materials	Multimedia Materials
Higher education instructional materials	30*	49	27
Other instructional materials (other adult education, K-12, preschool, etc.)	9	20	7
Other kinds of materials	19	33	13
Materials for use by this institution only	37	53	28
Materials for sale or distribution to other institutions, organizations, or individuals outside this institution	7	19	5

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*I.e., 30% of respondents reported that their institution produced audio higher education instructional materials during the past 12 months.

Source: Instructional Technologies questionnaire, questions 24 and 25.

AVM INSTRUCTIONAL TECHNOLOGY POLICIES

Access to and Use of Technologies

As noted in Chapter III, slightly over half (56 percent) of the schools surveyed have written policies addressing at least some aspects of faculty or student access to or use of instructional technologies (including computers). Fewer schools have written policies that specifically address AVM instructional technology issues.

- About a third (35 percent) have written policies regarding access to AVM equipment by faculty and/or students, with only an 18-point range across institutional types (from 28 percent of public and private 2-year schools to 46 percent of public comprehensives).
- A fourth (25 percent) have written policies about privacy and confidentiality issues in the use of instructional technologies, ranging from 9 percent of private 2-year schools to 40 percent of public comprehensives.
- Only 6 percent have policies regarding promotion and tenure credit for using instructional technologies in the classroom—ranging from none of the private doctoral schools to 9 percent of private comprehensive and liberal arts colleges.

Incentives and Assistance Provided to Faculty for Developing Instructional Materials

As noted earlier in this chapter, 61 percent of the CAO respondents reported that, to their knowledge, at least some of their faculty had developed AVM materials within the past 12 months. As shown in Exhibit V-25, almost all of these schools (92 percent) reportedly provide some kind of incentives and/or assistance to faculty for such activities. Typically, assistance is provided rather than compensation or promotion incentives, and there is considerable variation across types of institutions. For example:

Exhibit V-25

CAO RESPONDENTS' REPORTS OF INCENTIVES USUALLY PROVIDED TO FACULTY FOR DEVELOPING AUDIO, VIDEO, AND/OR MULTIMEDIA INSTRUCTIONAL MATERIALS, BY TYPE OF INSTITUTION

(Institutions Whose Faculty Have Developed Such Materials Within the Past 12 Months)

(Listed in Descending Order of "All Institutions" Percentages)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Technical production assistance	▲82*	74	▲74	60	▲47	70	—	65
Assistance in obtaining outside grants or contracts for the development of instructional materials	61	▲64	▲63	56	50	51	—	54
Clerical/logistical support	▲39	▲38	55	▲40	42	▲59	—	50
Grants to directly support the development of instructional materials	57	56	▲61	47	43	46	—	49
Credit toward promotion/tenure	28	28	▲49	36	▲52	▲17	—	32
Faculty retain rights to applications/programs they develop	36	▲59	▲38	30	32	▲22	—	30
Reduced course load	33	▲8	30	26	22	30	—	27
Faculty share in royalties	▲58	▲46	26	18	▲12	18	—	23
Additional compensation from the institution	16	▲3	11	10	▲5	▲18	—	12
Other incentives	9	5	11	4	13	6	—	8
No incentives	▲3	▲3	5	7	▲15	6	—	8

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*I.e., 82% of respondents at public doctoral institutions whose faculty have developed audio, video, and/or multimedia materials within the past 12 months reported that faculty who do so are usually given technical production assistance.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

—Too few respondents to provide a reliable estimate.

Source: CAO questionnaire, question 14.

- At all types of schools except liberal arts colleges, the most common kind of incentive or assistance provided is technical production assistance. Two-thirds of institutions whose faculty have developed materials provide this kind of assistance.
- Larger schools (the doctoral universities and public comprehensives) are somewhat more likely than smaller schools to provide assistance in obtaining grants or contracts for instructional material development (61 to 64 percent vs. 50 to 56 percent).

- Liberal arts and public comprehensive schools are considerably more likely than others to provide credit toward promotion or tenure (52 and 49 percent vs. 17 to 36 percent).
- Private doctoral universities are much more likely than others to allow faculty to retain rights to applications or programs they develop (59 percent vs. 22 to 38 percent).
- Private and, especially, public doctoral universities are much more likely than others to allow faculty to share in royalties (46 and 58 percent vs. 12 to 26 percent).

As shown in Exhibit V-26, faculty self-reports about incentives suggest that the various types of incentives are provided somewhat less commonly than is suggested by the CAO respondents and with somewhat less variability across institutional types.[1] Overall, 58 percent of faculty reported that either they or other faculty in their department have developed audio, video, computer-based, and/or

Exhibit V-26

FACULTY REPORTS OF INCENTIVES USUALLY PROVIDED TO FACULTY FOR DEVELOPING AUDIO, VIDEO, COMPUTER-BASED, AND/OR MULTIMEDIA INSTRUCTIONAL MATERIALS, BY TYPE OF INSTITUTION

(Respondents in Departments in Which Faculty Have Developed Such Materials)

(Listed in Descending Order of "All Faculty" Percentages)

	Doctoral	Comprehensive	Public 2-Year	All Faculty[a]
Credit toward promotion/tenure	34*	▲48	▲11	32
Grants from the department/ institution for developing materials	▲39	32	▲21	32
Assistance in obtaining grants or contracts for program development	28	30	23	27
Clerical/logistical support	28	26	21	26
Reduced course load	▲14	24	28	20
Faculty retain rights to applications/programs they develop	20	19	▲11	17
Faculty share in royalties	▲20	8	▲5	12
Additional compensation from the institution	5	7	10	7
None of the above	30	30	41	33

*I.e., 34% of faculty in doctoral institutions and in departments in which faculty have developed instructional materials reported that credit toward promotion or tenure is usually given to those who do so.

▲This percentage is statistically significantly different from that for all other types of faculty combined ($p < .05$).

[a] Includes faculty in liberal arts colleges, which comprise too small a sample to report separately.

Source: Faculty questionnaire, question 29.

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[1] Keep in mind, however, that faculty and institutional percentages are not directly comparable.

multimedia instructional materials. (There is no appreciable variation in this percentage by type of institution.) Of these, 67 percent reported that incentives of some kind are usually provided to faculty who develop materials. The most commonly provided incentives are credit toward promotion or tenure and grants for developing materials, reported by 32 percent of faculty, whereas the least common are faculty sharing in royalties (12 percent) and additional compensation (7 percent). Where there are appreciable differences by institutional type, faculty at public 2-year schools generally are the least likely to have reported that a given incentive is provided. The one exception is reduced course load. This incentive was reported by only 14 percent of faculty at doctoral schools, but by 24 and 28 percent of those at comprehensive and public 2-year schools. There are no consistent program-area differences.

INSTITUTIONAL LEADERSHIP IN AVM INSTRUCTIONAL TECHNOLOGIES

As shown in Exhibit V-27, leadership or direction in various instructional technology areas is widely dispersed. At the vast majority of schools (79 percent), the task of integrating technology into teaching is at least partially under the leadership of individual faculty or academic departments, and at about 6 in 10 schools (63 percent), academic administrators provide leadership. At only half of the schools (48 percent) do academic computing staff provide any leadership, and at even fewer schools do media resources staff (36 percent) or library staff (25 percent) provide any leadership in this area. In the area of acquiring/distributing equipment, although media resources staff are the most likely to provide leadership (58 percent), at about half of the schools (46 to 47 percent), faculty, department, and academic administrators provide leadership. And in the areas of instructional materials production, media resources staff and individual faculty or departments are about equally likely (51 percent and 47 percent, respectively) to provide leadership. The doctoral and public comprehensive schools were more likely than others to report that media resources staff provide leadership in each of these areas.

Exhibit V-27

GROUPS PROVIDING LEADERSHIP OR DIRECTION IN VARIOUS INSTRUCTIONAL TECHNOLOGY AREAS

	Doesn't Apply: Not Done Here	Academic Computing Staff	Library Staff	Media Resources Staff	Academic Administrators (e.g., Deans)	Individual Faculty/ Academic Department(s)	Other
Integration of technology into teaching	1	48*	25	36	63	79	6
Acquisition and distribution of audio, video, and multimedia equipment	1	29	39	58	46	47	5
Production of audio, video, and multimedia instructional materials	17	15	10	51	18	47	7

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*I.e., 48% of respondents reported that, at their institution, academic computing staff are providing leadership or direction regarding integration of technology into teaching.

Source: CAO questionnaire, question 18.

ACCOMPLISHMENTS TO DATE

Across all institutions, slightly over half of the respondents (56 to 60 percent) thought that they had done moderately or very well in meeting faculty and student needs regarding instructional technologies and in using instructional technologies to improve the overall quality of education at their school (Exhibit V-28). Slightly fewer than half (46 percent) thought they had done moderately or very well in developing clear plans for the use of instructional technologies. Only 12 percent gave themselves ratings of "moderately well" or "very well" for providing incentives and rewards to faculty for integrating instructional technologies into the classroom.

Exhibit V-28

PERCEIVED INSTITUTIONAL ACCOMPLISHMENTS REGARDING INSTRUCTIONAL TECHNOLOGIES

(Listed In Descending Order of Mean Ratings)

	Mean Rating	Not at All	Not Very Well	Moderately Well	Very Well	Have No Idea
Met **faculty** needs regarding equipment, technical support, and training for the use of instructional technologies	2.7	4*	35	47	13	2
Met **student** needs regarding equipment, technical support, and training for the use of instructional technologies	2.6	4	36	48	9	3
Used instructional technologies to improve the overall quality of education at your institution	2.6	5	38	45	11	2
Developed clear plans for the use of audio, video, and multimedia instructional technology	2.5	11	41	35	11	2
Provided incentives and rewards to faculty for integrating instructional technology into the classroom	1.8	33	50	9	2	6

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very well, 3 = moderately well, and 4 = very well.

*I.e., 4% of respondents reported that, in their opinion, their institution has not at all met faculty needs regarding equipment, technical support, and training for the use of instructional technologies.

Source: Instructional Technologies questionnaire, question 30.

There are few appreciable differences by institutional type on these items. The only discernible pattern is that private doctoral universities tended to give lower ratings than the other types of schools (Exhibit V-29).

Exhibit V-29

PERCEIVED INSTITUTIONAL ACCOMPLISHMENTS REGARDING INSTRUCTIONAL TECHNOLOGIES, BY TYPE OF INSTITUTION

(Listed in Descending Order of "All Institutions" Mean Ratings)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Met **faculty** needs regarding equipment, technical support, and training for the use of instructional technologies	▴2.6	▴2.5	2.7	2.7	2.7	▴2.8	—	2.7
Met **student** needs regarding equipment, technical support, and training for the use of instructional technologies	▴2.4	2.6	2.6	2.7	2.6	2.7	—	2.6
Used instructional technologies to improve the overall quality of education at your institution	2.6	▴2.4	2.6	2.5	2.6	▴2.7	—	2.6
Developed clear plans for the use of AVM instructional technology	▴2.6	▴2.3	2.6	2.4	▴2.3	2.5	—	2.5
Provided incentives and rewards to faculty for integrating instructional technology into the classroom	1.9	▴1.6	1.8	1.8	1.7	1.9	—	1.8

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very well, 3 = moderately well, and 4 = very well.

▴This mean is statistically significantly different from that for all other types of schools combined ($p < .05$).

—Too few respondents to provide a reliable estimate.

Source: Instructional Technologies questionnaire, question 30.

BARRIERS TO INCREASED AVM TECHNOLOGY USE

Considerably the largest perceived barrier, or impediment, to an institution's increased use of audio, video, and multimedia instructional technologies is insufficient funds, rated as a major impediment by two-thirds of institutions (67 percent) (Exhibit V-30). The next two largest impediments, rated as major by 40 and 38 percent of institutions, respectively, are lack of appropriate equipment and lack of space, both of which also tend to be a function of funds.

Lack of incentives or rewards to faculty for using instructional technologies also tends to be a relatively important impediment (rated as major by 29 percent), but top administrators' interest in expanded use of instructional technologies (which presumably could affect faculty incentives) tends not

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to be perceived as an issue (only 14 percent rated the lack of administrators' interest as a major impediment, and 40 percent rated it as not an impediment).

Items perceived as moderate impediments, with mean ratings of 2.5 to 2.7 include inadequate faculty technical skills or faculty technophobia, lack of infrastructure, and lack of strategic planning.

Exhibit V-30

PERCEIVED IMPEDIMENTS TO INCREASED USE OF AUDIO, VIDEO, AND MULTIMEDIA INSTRUCTIONAL TECHNOLOGIES AT THE INSTITUTION

(Listed in Descending Order of Mean Ratings)

	Mean Rating	Not an Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
Insufficient funds	3.5	2*	9	21	67	1
Lack of appropriate equipment	3.0	9	19	30	40	2
Lack of space	2.9	14	19	27	38	2
Lack of incentives/rewards to faculty for using instructional technologies	2.8	11	22	31	29	7
Inadequate faculty technical skills	2.7	8	32	40	17	3
Lack of staff who can provide training in instructional technologies	2.7	17	24	29	28	2
Lack of infrastructure (cabling, power outlets, etc.)	2.5	21	28	24	25	3
Lack of strategic planning	2.5	23	26	24	24	3
Faculty technophobia	2.5	10	42	31	14	3
Lack of appropriate organizational structures	2.4	26	25	24	20	5
Lack of appropriate instructional software	2.4	19	32	29	16	5
Copyright issues	2.4	24	25	24	16	10
Lack of faculty interest in expanded use of instructional technologies	2.3	25	31	33	10	1
Lack of top administrators' interest in expanded use of instructional technologies	2.1	40	19	24	14	3
Inadequate student technical skills	2.1	23	45	21	6	4
Student technophobia	1.7	42	41	11	1	4

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

*I.e., 2% of respondents reported that insufficient funds are not an impediment to the increased use of audio, video, and multimedia instructional technologies at their institution.

Source: Instructional Technologies questionnaire, question 29.

Least likely to be viewed as impediments are student technical skills and, especially, student technophobia.

Key findings by institutional type (Exhibit V-31) include the following:

- **Private doctoral institutions** were the most likely to view the various items as impediments; they had higher-than-average mean ratings on 5 of the 16 items, and only one rating (student technophobia) that was lower than average. (Note that these ratings are consistent with the relatively low "accomplishments" ratings given by private doctoral schools, shown in Exhibit V-29.) Items that private doctoral schools gave relatively high impediment ratings were lack of incentives/rewards to faculty, lack of strategic planning, lack of appropriate organizational structures, and lack of interest by faculty and top administrators.
- **Liberal arts colleges** also tended to give relatively high impediment ratings. They had higher-than-average means for lack of appropriate equipment, lack of staff who can provide training, lack of appropriate instructional software, and inadequate student technical skills. These ratings may reflect, in part, the absence of technical programs (e.g., computer science, engineering) in these schools.
- **Public 2-year schools** tended to give relatively low impediment ratings, and none of their ratings were higher than average. They were less likely than average to think that the following were impediments: lack of appropriate equipment, lack of staff who can provide training, faculty technophobia, and lack of top administrators' interest.
- The largest differences across institutional types are as follows:
  - Lack of strategic planning: 2.4 (public comprehensive and public 2-year) to 3.1 (private doctoral).
  - Lack of appropriate organizational structures: 2.3 (public doctoral and public comprehensive) to 3.0 (private doctoral).
  - Copyright issues: 2.2 (private comprehensive) to 2.8 (public doctoral).
  - Lack of top administrators' interest: 2.0 (public 2-year) to 2.7 (private doctoral).

Exhibit V-31

MEAN RATINGS, PERCEIVED IMPEDIMENTS TO INCREASED USE OF AUDIO, VIDEO, AND MULTIMEDIA INSTRUCTIONAL TECHNOLOGIES, BY TYPE OF INSTITUTION

(Listed in Descending Order of "All Institutions" Mean Ratings)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Insufficient funds	3.5	3.6	3.4	3.5	3.6	3.6	—	3.5
Lack of appropriate equipment	▲2.8	3.1	2.9	▲3.2	▲3.2	▲2.9	—	3.0
Lack of space	2.9	3.1	▲2.7	2.9	3.0	2.9	—	2.9
Lack of incentives/rewards to faculty for using instructional technologies	▲3.3	▲3.3	3.0	2.9	2.8	2.8	—	2.8
Inadequate faculty technical skills	2.7	2.7	2.7	2.6	2.8	2.6	—	2.7
Lack of staff who can provide training in instructional technologies	2.8	2.9	2.6	2.8	▲3.0	▲2.6	—	2.7
Lack of infrastructure (cabling, power outlets, etc.)	2.5	2.5	2.4	2.4	2.6	2.5	—	2.5
Lack of strategic planning	2.6	▲3.1	2.4	▲2.7	2.6	2.4	—	2.5
Faculty technophobia	2.6	2.7	2.5	2.6	2.6	▲2.4	—	2.5
Lack of appropriate organizational structures	2.3	▲3.0	2.3	2.5	2.5	2.4	—	2.4
Lack of appropriate instructional software	2.3	2.3	▲2.2	2.5	▲2.7	2.4	—	2.4
Copyright issues	▲2.8	2.4	2.3	▲2.2	2.4	2.4	—	2.4
Lack of faculty interest in expanded use of instructional technologies	2.3	▲2.6	2.2	2.3	2.3	2.3	—	2.3
Lack of top administrators' interest in expanded use of instructional technologies	2.1	▲2.7	2.2	2.3	2.2	▲2.0	—	2.1
Inadequate student technical skills	▲1.8	1.9	2.0	▲2.0	▲2.3	2.1	—	2.1
Student technophobia	▲1.5	▲1.5	1.6	1.7	1.7	1.7	—	1.7

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

▲This mean is statistically significantly different from that for all other types of schools combined ($p < .05$).

—Too few respondents to provide a reliable estimate.

Source: Instructional Technologies questionnaire, question 29.

INSTITUTIONAL PLANS AND EXPECTATIONS

Use of Instructional Technologies

The vast majority (80 to 89 percent) of respondents to both the CAO and Instructional Technologies questionnaires believe that instructional uses of video and multimedia technologies will increase over the next 3 years (Exhibit V-32). Two-thirds (66 percent) think that use of multimedia self-paced learning packages will increase. (Note that 23 percent of respondents had no idea about the future of these learning packages.) Future use of audio technologies, however, is a different matter. Only one fourth to about a third (36 percent) think audio use will increase. About half (53 and 54 percent) of the respondents to the two questionnaires think use of audio technologies will remain about the same, and 13 percent of the Instructional Technology questionnaire respondents think use will decline. There are no large or consistent differences among the various institutional types on these items.

Exhibit V-32

HOW USE OF INSTRUCTIONAL TECHNOLOGIES BY FACULTY AND IN COURSES WILL CHANGE OVER THE NEXT 3 YEARS

	Increase	Stay the Same	Decrease	Have No Idea
CAO respondents				
Number of faculty who use **multimedia** technologies for on-campus instructional purposes	89*	7	1	3
Number of faculty who use **video** technologies for on-campus instructional purposes	80	19	1	1
Number of faculty who use **audio** technologies for on-campus instructional purposes	36	54	6	4
Instructional Technology respondents				
Number of on-campus courses that use **multimedia** technologies	87	6	<1	7
Number of on-campus courses that use **video** technologies	85	11	<1	4
Number of on-campus courses in which **multimedia self-paced** learning packages are used	66	12	<1	22
Number of on-campus courses that use **audio** technologies	25	53	13	10

---

*I.e., 89% of respondents indicated that they believe the number of faculty who use multimedia technologies for on-campus instructional purposes will increase over the next 3 years.

Sources: CAO questionnaire, question 21.
Instructional Technologies questionnaire, question 26.

137

Instructional Technology Expenditures

With the exception of CAO respondents' expectations regarding expenditures for audio equipment, most CAO and Instructional Technology questionnaire respondents expect that their institution's expenditures will increase for instructional technologies equipment, software, training, and support (Exhibit V-33). CAO respondents generally are more likely than Instructional Technology respondents to think that expenditures will increase. For example, 88 percent of CAO respondents think that expenditures will increase for faculty/student training, compared with 73 percent of Instructional Technology respondents.

Exhibit V-33

HOW THE INSTITUTION'S EXPENDITURES IN EACH LISTED AREA WILL CHANGE OVER THE NEXT 3 YEARS

	Increase	Stay the Same	Decrease	Have No Idea
CAO respondents				
Training of faculty/students in use of instructional technologies	88*	9	1	2
Multimedia equipment	87	11	1	2
Instructional-technologies technical support	80	16	1	3
Video equipment	67	30	3	<1
Video production (production of live or taped telecourses, etc.)	55	36	2	6
Audio equipment	30	57	11	2
Instructional Technology respondents				
Purchase of audio, video, and multimedia **software**	76	19	1	3
Training of faculty or students in use of audio, video, and/or multimedia materials	73	21	1	5
Purchase and maintenance of audio, video, and multimedia hardware **installed in classrooms**	72	22	2	5
Training of faculty or students in **production** of audio, video, and/or multimedia materials	61	29	2	8
Instructional-technologies technical support	60	29	2	9
Purchase and maintenance of audio, video, and multimedia hardware **available for loan to faculty or students**	60	31	3	6
Purchase and maintenance of audio, video, and multimedia hardware **for production facilities**	56	30	3	11

The "stay the same" category includes those who indicated that both current and likely future expenditures in a given area are zero.

*I.e., 88% of respondents indicated that they believe expenditures for training of faculty and/or students in use of instructional technologies will increase over the next 3 years.

Sources: CAO questionnaire, question 22.
Instructional Technologies questionnaire, question 27.

One reason for the differences is that the CAO respondents probably tended to include computer-related expenses in their responses, whereas the Instructional Technology respondents probably did not. Public doctoral and public comprehensive Instructional Technology respondents tend to be somewhat more likely than those at other schools to think that expenditures will increase, but the differences are not large. Among CAO respondents, there are no discernible patterns of differences by institutional type.

CAO respondents were asked whether the instructional technology purchases that they expect to make over the next 3 years are likely to be mostly replacements and upgrades of existing equipment or likely to be mostly additional equipment. As shown in Exhibit V-34, the newer the technology, the more likely respondents are to purchase mostly additional equipment. Thus, only 18 percent expect that audio equipment purchases will be mostly additional equipment, compared with 41 percent for video equipment and 71 percent for multimedia equipment.

Exhibit V-34

EXPECTATIONS REGARDING TYPES OF PURCHASES OVER THE NEXT 3 YEARS

	No Likely Purchases of This Type	Mostly Will Replace or Upgrade	Mostly Will Purchase Additional Equipment	Will Do About the Same Amount of Replacements and Additional Equipment	Have No Idea
Audio equipment	7*	48	18	21	6
Video equipment	2	31	41	24	1
Multimedia equipment	3	15	71	8	3

---

*I.e., 7% of respondents indicated that they are not likely to make any purchases of audio equipment over the next 3 years.

Source: CAO questionnaire, question 23.

Expected Changes in Sources of Funding for Instructional Technologies

In spite of the fact that sizable majorities of respondents indicated that instructional technology expenditures in many areas will increase, no more than about half of the respondents believe that funding from any given source will increase (Exhibit V-35). The funding sources most likely to increase are general operating funds and business, industry, and foundation contracts and grants, expected to increase at 52 percent and 50 percent of institutions, respectively. Slightly less than half of the schools (43 percent) expect instructional technology funding from donations and gifts to increase. Considerably the least likely source of funding is internally generated funds, such as licensing of institutionally produced software; 42 percent of institutions reported that this is not a current or likely future source of funds at all, and only 17 percent expect this source to increase. In interpreting any of these percentages, however, the relatively high percentages of "have no idea" responses should be kept in mind. Not only do they indicate that many respondents cannot answer these questions, they also suggest that the reliability of all the responses on these questions may not be very high.

Exhibit V-35

LIKELY CHANGES OVER THE NEXT 3 YEARS IN SOURCES OF FUNDING FOR AUDIO, VIDEO, AND MULTIMEDIA INSTRUCTIONAL TECHNOLOGIES

(Listed in Descending Order of the Percentages Who Expect an Increase)

	Doesn't Apply: Not a Current or Likely Future Source of Funds	Increase	Stay the Same	Decrease	Have No Idea
General operating funds of the institution	2*	52	30	9	7
Business, industry, and foundation contracts and grants	8	50	18	2	21
Donations and gifts	8	43	24	2	23
Federal contracts and grants	13	39	20	3	25
Student/faculty fees for use of computers and other instructional technologies	25	36	25	1	12
Special state appropriations	28	22	20	7	23
Internally generated funds (e.g., licensing of institutionally produced software)	42	17	18	2	21

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*I.e., 2% of respondents indicated that the general operating funds of the institution are not a current or likely future source of funds for audio, video, and multimedia instructional technologies.

Source: Instructional Technologies questionnaire, question 28.

Instructional Technologies' Potential

Three-quarters of the CAO respondents (78 percent) believe that classroom uses of audio, video, and multimedia technologies have a great deal of potential to help meet the institution's instructional mission (Exhibit V-36). There are no large differences by institutional type on this item. Far fewer (38 percent) believe that these technologies have a great deal of potential to help meet the institution's community service mission. Percentages by institutional type here range from lows of 24 and 29 percent at liberal arts and private doctoral schools, respectively, to a high of 50 percent at public 2-year schools.

Exhibit V-36

PERCEIVED POTENTIAL OF CLASSROOM USES OF AUDIO, VIDEO, AND MULTIMEDIA TECHNOLOGIES TO HELP MEET THE INSTITUTION'S MISSIONS

	Doesn't Apply	None	Some	A Great Deal	Have No Idea
Potential to help meet the institution's instructional mission	—	<1*	21	78	1
Potential to help meet the institution's community service mission	5	6	47	38	3

---

*I.e., fewer than 1% of respondents indicated that classroom uses of audio, video, and multimedia technologies have no potential to help meet the institution's instructional mission.

Source: CAO questionnaire, questions 19 and 20.

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VI. INSTRUCTIONAL TECHNOLOGIES IN THE LIBRARIES

INTRODUCTION

This chapter covers various issues related to college and university library uses of and access to computers and computer-based services. Questions covered in this chapter were asked in the Library questionnaire. See Chapter II for a description of the institutional samples and respondents and definitions of the various types of institutions discussed below.

ELECTRONIC ACCESS TO LIBRARY SERVICES

Eight in 10 schools (79 percent) currently have electronic-format catalog systems (e.g., online or CD-ROM systems) for their main library, and another 12 percent expect to have them in the next 3 years (Exhibit VI-1). Essentially all the doctoral and public comprehensive schools (96 to 100 percent) have electronic-format catalog systems, as do large majorities of all other types of schools except the private 2-year schools. Fewer than half (42 percent) of private 2-year schools have an electronic-format catalog system. The vast majority of schools with such systems (87 percent) have entered three-fourths or more of their library's existing collection into this catalog (34 percent have entered all of their existing collection), and essentially all schools (98 percent) that do not now have all of their collection in the online catalog intend to continue entering more over the next 3 years.

Exhibit VI-1

ELECTRONIC-FORMAT CATALOG SYSTEMS, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Have now	▲100*	▲98	▲96	▲88	▲72	76	▲42	79
Expect to have within the next 3 years	▲0	▲2	▲3	▲8	▲17	14	▲29	12
Don't have now and don't expect to have within the next 3 years	▲0	▲0	▲1	▲4	11	10	▲29	9

---

*I.e., 100% of public doctoral respondents reported that their library has an electronic-format catalog system.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Library questionnaire, question 1.

Among schools with electronic-format catalog systems, 41 percent of the CAO respondents reported that the school has written policies about access to these catalogs. Within this subset, public 2-year schools are considerably less likely than any of the 4-year schools to have written policies (29 percent vs. 42 to 53 percent).

The most common online catalog platform is an on-campus computer dedicated to library functions, used at about half (48 percent) of the institutions (Exhibit VI-2). About a fourth of the schools (27 percent) use an off-campus computer operated by an outside organization, and another fourth (25 percent) have an on-campus computer that is used for both library and other functions. The dedicated library computer is the most common platform at all types of schools except public doctoral universities, which are about equally likely to have an on-campus computer that is used for both library and other functions.

Exhibit VI-2

TYPE OF ONLINE CATALOG PLATFORM, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Off-campus computer operated by an outside organization	▲17*	▲13	21	27	31	29	—	27
On-campus computer dedicated to library functions	▲40	49	48	▲57	▲57	▲41	—	48
On-campus computer used for library and other functions	▲43	▲38	31	▲16	▲11	29	—	25

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*I.e., 17% of public doctoral respondents reported that the platform for their library's online catalog is an off-campus computer operated by an outside organization.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

—Too few respondents to provide a reliable estimate.

Source: Library questionnaire, question 2.

At essentially all schools (99 percent) that have online catalogs, the catalog can be accessed from terminals or PCs in the library (Exhibit VI-3). Dialup access from outside the library also is quite common, being available at 63 percent of schools. About half of the schools provide access through either a campus network (52 percent) or outside network such as the Internet (46 percent). Least common is access from hard-wired terminals outside the library, available at only 29 percent of the schools.

Essentially all of the public doctoral universities (95 to 100 percent) and the vast majority of the private doctoral universities (85 to 100 percent) provide library catalog access in all of these ways except through hard-wired terminals outside the library, which is provided by 68 percent of the public doctorals and 55 percent of the private doctorals. All kinds of access except outside hard-wired terminals also are available at 50 percent or more of the other kinds of 4-year schools. Public 2-year schools are the least likely to have each type of access except for the in-library terminals.

Exhibit VI-3

WAYS IN WHICH THE ONLINE CATALOG CAN BE ACCESSED, BY TYPE OF INSTITUTION

(Schools That Have Online Catalogs)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
From terminals/PCs in the library	100*	100	99	97	100	98	—	99
Through dialup access from outside the library	▲99	▲95	▲87	▲70	65	▲48	—	63
Through a campus network	▲97	▲89	▲72	55	58	▲35	—	52
Through an outside network (e.g., Internet)	▲95	▲85	▲71	50	▲56	▲24	—	46
From hard-wired terminals outside the library	▲68	▲55	▲47	28	25	▲21	—	29

*I.e., 100% of public doctoral respondents reported that their library's online catalog can be accessed from terminals or PCs in the library.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

—Too few respondents to provide a reliable estimate.

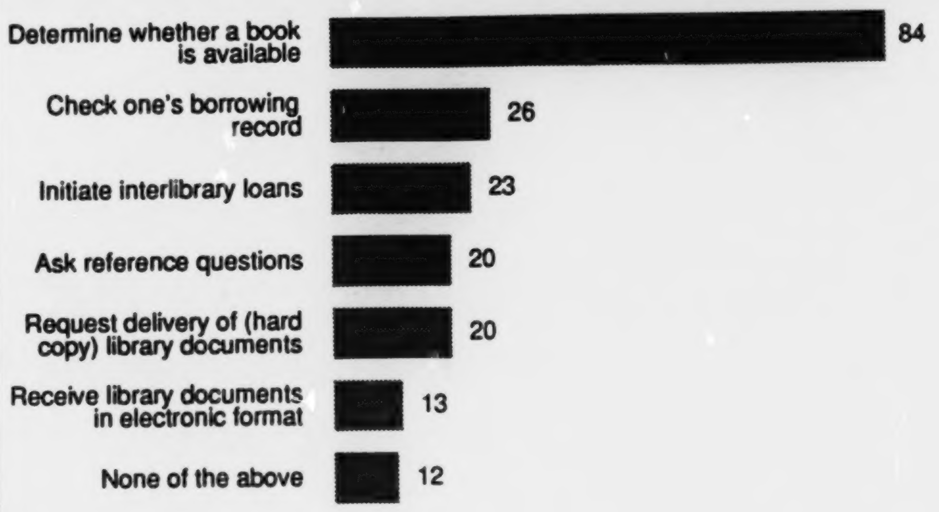
Source: Library questionnaire, question 5.

Only one computer-access service of six that were listed is commonly available to patrons. At 84 percent of schools, library patrons can determine electronically whether a book is available (Exhibit VI-4). None of the other services is available at more than about a fourth of the schools. However, most school libraries (72 percent) do sometimes deliver documents by fax as a service to patrons. Also, almost all schools (95 percent) reported that they have plans to expand electronic access to library services over the next 3 years.

Exhibit VI-4

PERCENTAGE OF SCHOOLS THAT PROVIDE EACH LISTED COMPUTER-ACCESS SERVICE TO LIBRARY PATRONS

(Schools That Have Online Catalogs)



Source: Library questionnaire, question 6.

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INSTRUCTIONAL TECHNOLOGY LIBRARY MATERIALS

A large majority of libraries have a variety of audio, video, multimedia, and computer-based instructional materials available to their patrons for in-library use or for loan (Exhibit VI-5). For almost all types of materials, schools are considerably more likely to make the materials available for in-library use than for loan. Most commonly available for in-library use are microfiche or microfilm (at 88 percent of schools) and CD-ROMs that are text-only CDs, databases, etc. (available at 85 percent of schools). More sophisticated CD-ROMs—those that integrate text and visual images, such as CD-ROM-based encyclopedias—are available for in-library use at 57 percent of schools. Other computer software is available at 54 percent of schools. These materials, especially CD-ROMs, tend not to be available for loan. [About half of the institutions (52 percent) also reported that their library has microcomputers available in the library for general-purpose use by faculty, and slightly more (58 percent) have them available for students.]

Also widely available for in-library use are videotapes (70 percent); records, audiotapes, and/or audio CDs (64 percent); and public television video materials (61 percent). Except for public TV materials, these items are about as commonly available for loan as for in-library use. Films are reportedly available for in-library use at almost half of the institutions (45 percent) and available for loan at a third (32 percent). About a fourth of the institutions (23 percent) have NPR- or APR-produced audio materials available for in-library use, and 18 percent have them available for loan. There tend to be fairly small differences by institutional type in the availability of these materials, although private 2-year schools typically are less likely than other schools to have them.

Exhibit VI-5

AVAILABILITY OF LIBRARY MATERIALS

(Listed in Descending Order of Availability for Use in the Library)

	For Loan	For In-Library Use
Microfiche or microfilm	14*	88
CD-ROMs that are text-only CDs, databases, etc. (not those that integrate text and visual images)	5	85
Videotapes	65	70
Records, audiotapes, and/or audio CDs	67	64
Video materials produced by public television (PBS Video, Annenberg/CPB Project telecourses, etc.)	40	61
Electronic materials that integrate text and visual images, such as CD-ROM-based encyclopedia	3	57
Computer software (other than CD-ROMs)	20	54
Films	32	45
Audio materials produced by National Public Radio (NPR) or by American Public Radio (APR)	18	23

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*I.e., 14% of respondents reported that the library has microfiche or microfilm available to library patrons for loan.

Source: Library questionnaire, question 13.

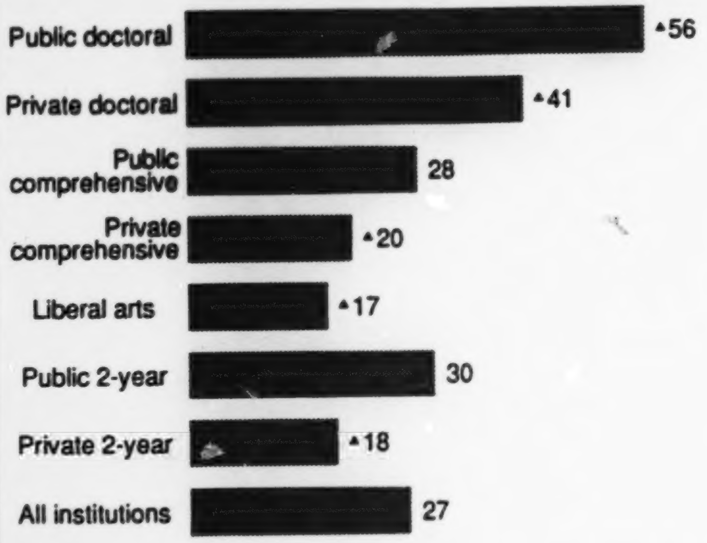
ELECTRONIC-FORMAT JOURNALS

About a fourth of the schools (27 percent) reported that their library currently subscribes to one or more electronic journals (defined as "periodicals, serials, etc., provided in electronic format rather than paper copies").[1] There is considerable variation in this percentage by type of institution, ranging from a high of 56 percent of public doctoral universities to lows of 17 and 18 percent of liberal arts and private 2-year schools (Exhibit VI-6). Public institutions are more likely to subscribe than their private counterparts.

The range in the number of electronic journals to which libraries subscribe is enormous: 1 to 1,300. Among the institutions that subscribe to at least one electronic journal, 13 percent subscribe to just one, 47 percent subscribe to 2 to 20 journals, 19 percent subscribe to 21 to 100 journals, and 21 percent subscribe to more than 100 journals. At least some of the schools that subscribe to a great many journals do so through services rather than through individual subscriptions.

Exhibit VI-6

PERCENTAGE OF INSTITUTIONS WITH LIBRARIES THAT SUBSCRIBE TO ELECTRONIC JOURNALS, BY TYPE OF INSTITUTION



▴This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Library questionnaire, question 9.

As with access to online card catalogs, by far the most common kind of access to electronic journals is via terminals or PCs in the library, provided by 85 percent of those that subscribe to electronic journals. The next most commonly provided access is through a campus network or by obtaining paper copies of the articles from the library (both 36 percent). About a fourth of the institutions (27 percent) provide access through an outside network, such as the Internet, or by dialing up from outside the library. Seventeen percent provide access from hard-wired terminals outside the library, and 14 percent provide access through CD-ROMs that are available for loan to patrons.

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[1] Note that this definition includes more than just academic journals.

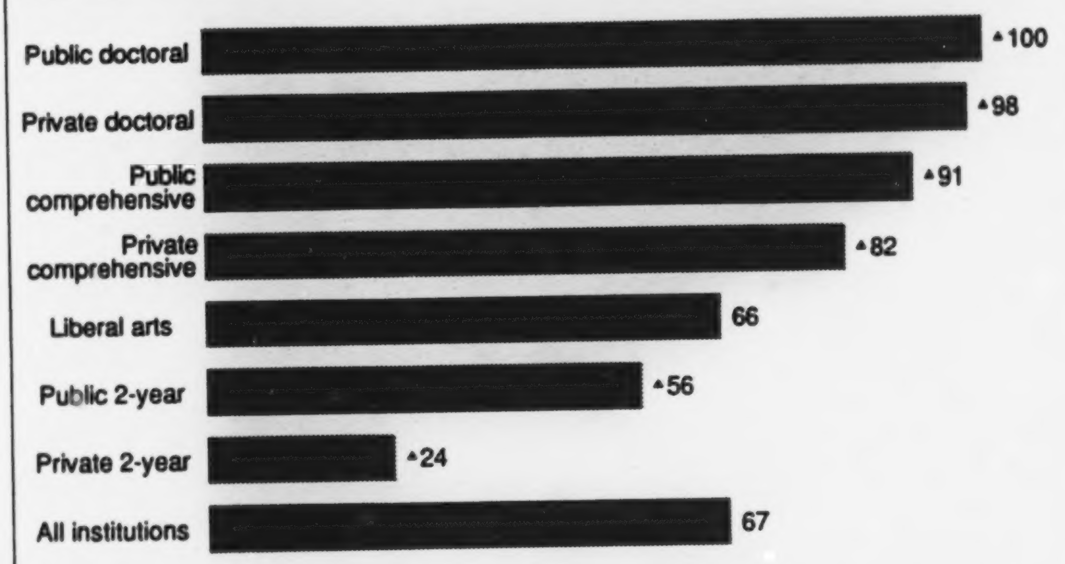
NETWORKING

Internet/Bitnet Access

Two-thirds (67 percent) of institutions reported that their library is connected to the Internet or Bitnet, very close to the 70 percent reported in Chapter II for overall institutional connections to the Internet or Bitnet. The percentages of each type of institution range from 100 percent of the public doctoral universities to 24 percent of the private 2-year colleges (Exhibit VI-7), also very similar to the percentages reported in Chapter III.

Exhibit VI-7

PERCENTAGE OF INSTITUTIONS WHOSE LIBRARIES HAVE ACCESS TO INTERNET/BITNET, BY TYPE OF INSTITUTION



*This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Library questionnaire, question 14.

Of those institutions that are connected to the Internet or Bitnet, about 6 in 10 (61 percent) allow faculty library patrons to have direct network access, and about half (47 percent) allow direct access by students (Exhibit VI-8). All but 7 percent of institutions provide some kind of assistance to network users, most commonly in the form of training, answering questions, and so on (provided by 80 percent of institutions). Also quite common are menus developed to facilitate access (at 58 percent of schools). About half of the schools (46 percent) also have a file server to download text files via Internet or Bitnet.

Exhibit VI-8

INTERNET/BITNET ACCESS ISSUES

Library is connected to the Internet or Bitnet	67*
Among those libraries with an Internet/Bitnet connection:	
Faculty library patrons have direct access	61
Student library patrons have direct access	47
Neither faculty nor students have direct access	38
Library staff provide training, answer questions, etc., re: Internet/Bitnet access	80
Menus have been developed to facilitate access	58
Manuals are provided	34
Other kinds of assistance	33
No Internet/Bitnet assistance provided	7
Library has file server to download text files via Internet or Bitnet	46

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*I.e., 67% of respondents reported that their library is connected to the Internet or Bitnet.

Source: Library questionnaire, questions 14 - 17.

Online and CD-ROM-Based Bibliographic and Full-Text Resources

A large majority of schools (77 percent) reported that they have access to external online bibliographic resources, such as DIALOG or ERIC, and half (50 percent) have access to external CD-ROM-based bibliographic resources (Exhibit VI-9). Much less common is access to external online full-text resources, such as NEXIS, which is provided by only 29 percent of institutions. The 2-year schools, especially the privates, are less likely to provide access to these resources than are the 4-year schools; 27 percent of public 2-year schools and about half (48 percent) of private 2-year schools do not provide any access to external bibliographic resources, compared with 0 to 8 percent of the 4-year schools. Access to full-text resources is much more common at the doctoral institutions than at other types of schools—71 and 74 percent vs. 18 to 43 percent.

Exhibit VI-9

ACCESS TO BIBLIOGRAPHIC AND FULL-TEXT RESOURCES, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Library has access to external online bibliographic resources (DIALOG, ERIC, etc.)	▲100*	▲98	▲95	▲88	▲89	▲63	▲37	77
Library has access to external CD-ROM-based bibliographic resources	▲67	52	▲67	▲57	54	▲39	▲36	50
No access to external bibliographic resources	▲0	▲0	▲2	▲5	▲8	▲27	▲48	16
Library has access to external online full-text resources (e.g., NEXIS)	▲74	▲71	▲39	▲43	▲24	▲18	▲21	29

*I.e., 100% of public doctoral respondents reported that their library has access to external online bibliographic resources.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Library questionnaire, questions 18 and 21.

Among libraries with access, essentially all give library staff direct access to both bibliographic (98 percent) and full-text (95 percent) external resources (Exhibit VI-10). Roughly two-thirds (61 to 68 percent) give faculty and students direct access to these resources. About half (43 to 53 percent) give other school staff direct access. The general public are relatively unlikely to have direct access, especially to full-text resources (19 percent). Differences by institutional type are largest with regard to student access, which is most common at the doctoral universities and least common at the public 2-year schools. For example, 81 percent of the public doctorals and 88 percent of the private doctorals give students direct access to external bibliographic resources, whereas only 50 percent of the public 2-year schools do so.

In general, policies about who pays for use of these resources tend to be the same for students and faculty. The majority of schools (61 percent of those that provide access) provide free access to full-text resources to both students and faculty, but somewhat fewer provide free access to bibliographic resources (45 and 50 percent, respectively). About a fourth (23 to 28 percent) reported that who pays varies by the service or the resources used. At 9 to 16 percent of the schools, the end user pays some of the cost, and at 7 to 11 percent of the schools, the user pays the full cost.

The schools most likely to provide these resources at no cost to the user are liberal arts and public 2-year schools,[2] whereas those most likely to charge are the doctoral universities. For example, 58 percent of liberal arts and public 2-year schools provide bibliographic resources at no charge to faculty, compared with 48 percent of the private comprehensives, 34 percent of the public comprehensives, and 25 percent of the doctoral universities.

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[2] There are too few private 2-year school respondents to include in this analysis.

Exhibit VI-10

EXTERNAL BIBLIOGRAPHIC AND FULL-TEXT ACCESS ISSUES

(Schools That Provide Access to These Resources)

	Bibliographic Resources (DIALOG, ERIC, etc.)	Full-Text Resources (e.g., NEXIS)
Among those libraries with access		
Library staff have direct access	98*	95
Faculty have direct access	67	68
Students have direct access	61	65
Other staff at the institution have direct access	53	43
General public has direct access	35	19
Who pays for faculty use		
Library makes the service available at no cost to user	50	61
Varies by service or by resources used	28	23
User pays some of the cost (library subsidizes the cost)	13	9
End user pays full cost	9	7
Who pays for student use		
Library makes the service available at no cost to user	45	61
Varies by service or by resources used	28	23
User pays some of the cost (library subsidizes the cost)	16	9
End user pays full cost	11	7

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*I.e., 98% of respondents whose library has access to external bibliographic resources such as DIALOG or ERIC reported that library staff have direct access to those resources.

Source: Library questionnaire, questions 19, 20, 22, and 23.

ELECTRONIC PUBLISHING

Nine percent of institutions reported that they had published materials electronically in the past 12 months. (Electronic publishing was defined as "the public issuance of text, graphics, and/or video in electronic format, such as online, CD-ROM, etc.") The doctoral universities are much more likely than other types of schools to have done so; 29 and 32 percent of the private and public doctoral institutions, respectively, reported that they had published materials electronically, compared with 10 percent or fewer of other types of schools. Respondents who have published these materials were asked how many they had published in the past 12 months, but the sizable nonresponse on this item (fewer than half of those to whom the question applied provided an answer), as well as other comments received, suggests that there is a fair amount of confusion about what constitutes electronic publishing. Thus, these results should be interpreted with caution.

TRAINING PROVIDED TO LIBRARY PATRONS

Among those institutions at which the assistance is relevant, large majorities (83 to 88 percent) reported that library staff provide informal assistance to faculty and students regarding electronic database searches and use of online catalogs (Exhibit VI-11). Formal training on these topics is somewhat less common overall and more often provided to students than to faculty. For example, 67 percent of institutions provide formal training to students in electronic database searches, whereas 51 percent provide this kind of formal training to faculty. Among institutions that have access to the Internet or Bitnet, assistance (both formal and informal) in use of these resources is more often provided to faculty than to students, probably because faculty are more likely than students to have access to these networks. For example, library staff provide informal assistance in use of Internet/Bitnet resources to faculty at two-thirds of the institutions (67 percent) and to students at about half of the institutions (53 percent).

Exhibit VI-11

TOPICS ON WHICH LIBRARY STAFF OFFER TRAINING OR ASSISTANCE

(Schools at Which Each Kind of Training is Relevant)

	Formal Training		Informal Assistance	
	For Faculty	For Students	For Faculty	For Students
Searching of electronic databases	51*	67	88	84
Use of online catalogs	53	74	88	83
Use of Internet/Bitnet resources	40	30	67	53

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*I.e., 51% of respondents reported that library staff provide formal training to faculty in searching electronic databases.

Source: Library questionnaire, question 29.

INSTITUTIONAL LEADERSHIP IN ACCESS TO ELECTRONIC DATABASES

According to CAO respondents, library staff are the most likely group at all types of institutions to provide leadership or direction in accessing online and/or CD-ROM databases (Exhibit VI-12). At almost three-fourths of institutions (71 percent), library staff provide leadership or direction in this area. They are especially likely to do so at private comprehensive and private doctoral universities (82 and 90 percent, respectively). The next most likely group to provide leadership in this area are academic computing staff (42 percent). Other groups provide leadership at no more than a fourth of the institutions. (As is evident from the sum of these percentages, at many schools leadership is provided by more than one group of staff.) The relatively low percentages of several groups at public 2-year schools reflects, at least in part, the relatively low percentages of public 2-year schools that provide access to online and CD-ROM databases.

Exhibit VI-12

GROUPS THAT PROVIDE LEADERSHIP OR DIRECTION IN ACCESSING ONLINE AND/OR CD-ROM DATABASES, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Library staff	78*	▲90	77	▲82	72	▲65	65	71
Academic computing staff	▲60	▲62	▲53	40	39	37	—	42
Academic administrators (e.g., deans)	▲15	15	24	20	▲17	▲32	—	25
Individual faculty/academic department(s)	19	15	24	20	▲14	22	—	20
Media resources staff	16	▲2	13	▲8	▲7	▲21	—	14
Other	11	6	▲3	7	4	9	—	7

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*I.e., at 78% of public doctoral institutions, CAO respondents reported that library staff provide leadership or direction in accessing online and/or CD-ROM databases.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: CAO questionnaire, question 18g.

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CHANGES MADE TO SUPPORT ELECTRONIC ACCESS TO MATERIALS

Almost all institutions (90 percent) reported that they have made at least some changes over the past 3 years to support increasing reliance on electronic access to materials (Exhibit VI-13). The change most commonly reported (by 77 percent of institutions) is that resources (dollars and/or staff time) have been increased for library automation activities and/or electronic technologies. Majorities also reported that resources have been shifted from print to electronic media (63 percent) and that resources have been increased for training end users and/or library staff in use of electronic media (53 percent). In contrast, only a few schools (9 percent) reported having made changes in branch library structure due to the electronic availability of materials. These changes tended to be most frequent at the doctoral institutions (especially the public doctoral schools) and at public comprehensive institutions.

Exhibit VI-13

CHANGES MADE IN THE PAST 3 YEARS TO SUPPORT ELECTRONIC ACCESS TO MATERIALS, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Resources (dollars/staff time) have been increased for library automation activities and/or electronic technologies	▲93*	▲88	▲88	78	78	▲71	—	77
Resources (dollars/staff time) have been shifted from print media to electronic media	▲80	70	▲72	57	58	62	—	63
Resources (dollars/staff time) have been increased for training end users and/or library staff in use of electronic media	▲85	▲73	▲68	56	50	▲43	—	53
Changes have been made in branch library structure due to the electronic availability of materials	▲17	▲18	▲5	8	▲4	12	—	9
None of the above	▲1	▲4	▲3	8	14	11	—	10

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*I.e., 93% of public doctoral respondents reported that, in the past 3 years, resources have been increased for library automation activities and/or electronic technologies.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Library questionnaire, question 28.

COOPERATIVE PRACTICES WITH OTHER INSTITUTIONS

As shown in Exhibit VI-14, the most common cooperative practices in which libraries engage are providing patron and/or staff access to other libraries' online catalogs (66 percent of institutions do this) and participating in electronic interlibrary loans (65 percent). A majority (56 percent) also allow other libraries to access their online catalog. About a third (32 percent) reported that they are involved in the cooperative development or purchase of electronic information, and about a fourth (27 percent) share database licensing costs. In general, as with changes made to support electronic access, these practices are most commonly done at the doctoral institutions, especially the public doctorals, and at the public comprehensive schools. In contrast, the public 2-year schools are less likely than average to do any of these activities.

Exhibit VI-14

COOPERATIVE PRACTICES WITH OTHER INSTITUTIONS, BY TYPE OF INSTITUTION

(Listed in Descending Order of the "All Institutions" Percentages)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Patron/staff access to other libraries' online catalogs	▲97*	▲79	▲84	71	67	▲57	—	66
Electronic interlibrary loan	▲82	▲75	▲78	69	66	▲58	—	65
Allowing other libraries to access your online catalog	▲97	▲82	▲83	▲64	56	▲42	—	56
Cooperative development or purchase of electronic information	▲71	▲41	▲50	29	▲26	▲27	—	32
Sharing the cost of database licensing	▲67	27	▲45	25	▲20	▲23	—	27
None of the above	▲0	▲2	▲1	15	12	▲18	—	13

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*I.e., 97% of public doctoral respondents reported that their library provides patron and/or staff access to other libraries' online catalogs.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Library questionnaire, question 24.

BARRIERS TO INCREASED AUTOMATION

From the perspective of Library questionnaire respondents, by far the most important impediment to the expansion of automation in the library is insufficient funds, rated as a major impediment by two-thirds (68 percent) of respondents; the mean rating on a 4-point scale is 3.6, more than a full point higher than the next most important impediment (Exhibit VI-15). Only one other item, lack of space, is considered a major impediment by even as many as a fourth of the respondents. It was rated as major by 27 percent of respondents and received a mean rating of 2.5. In general, Library respondents tend to view the various potential impediments as less important than do the other sets of respondents. The mean ratings here are typically in the 2.0 to 2.1 range, compared with typical mean ratings of 2.4 to 2.6 for the other institutional respondents.

After insufficient funds and lack of space, Library respondents view complicated user interfaces and copyright issues as the next most important impediments, with mean ratings of 2.2. The relatively high "have no idea" ratings, however, (9 and 10 percent, respectively) suggest that these concepts or their potential as impediments may not be well understood.

Among the various staff-related impediments, the most important is the lack of staff who can provide training in electronic media use (mean = 2.1), although lack of staff who are knowledgeable about electronic media is much less of a concern (mean = 1.8). Technophobia among either patrons or staff is definitely not perceived as a problem (means = 1.6 and 1.5, respectively).

Mean ratings of impediments by type of institution (Exhibit VI-16) show that public doctoral and public 2-year schools are the most likely to give relatively high ratings, whereas private doctoral schools are the most likely to give relatively low ratings.

- Items on which **public doctoral schools** give above-average ratings are complicated user interfaces (mean = 2.6), copyright issues (mean = 3.0), and the four items dealing with the inadequate computer skills and technophobia of staff and patrons (means of 2.2 and 2.3 on the skills items and 1.7 and 1.8 on the technophobia items).
- Items on which **public 2-year schools** give above-average ratings are lack of space (mean = 2.7), lack of strategic planning (mean = 2.2), lack of staff who can provide training in electronic media (2.2) and who are knowledgeable about electronic media (1.9), lack of network access (2.3), lack of top administrators' interest in expanded automation of the library (2.3), and lack of appropriate library organizational structure (1.8).
- Items on which **private doctoral schools** give below-average ratings are insufficient funds (mean = 3.4), lack of space (2.3), lack of strategic planning (1.9), lack of staff who can provide training (1.8) and who are knowledgeable (1.5), lack of network access (1.6), and lack of top administrators' interest (1.7).

Exhibit VI-15

PERCEIVED IMPEDIMENTS TO THE EXPANSION OF AUTOMATION IN THE LIBRARY

(Listed in Descending Order of Mean Ratings)

	Mean Rating	Not an Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
Insufficient funds	3.6	2*	8	22	68	1
Lack of space	2.5	27	24	21	27	<1
Complicated user interfaces	2.2	24	31	26	10	9
Copyright issues	2.2	30	24	19	16	10
Lack of strategic planning	2.1	39	25	20	13	2
Lack of staff who can provide training in use of electronic media	2.1	33	32	24	10	1
Incompatible or inappropriate hardware/software	2.1	32	29	21	12	6
Lack of network access	2.1	44	18	17	16	4
Lack of top administrators' interest in expanded automation of the library	2.0	47	16	22	14	2
Inadequate library staff computer skills	2.0	33	40	21	5	1
Inadequate library patron computer skills	2.0	28	44	22	4	2
Lack of staff knowledgeable about electronic media (online resources, CD-ROMs, networks, etc.)	1.8	43	39	15	3	1
Lack of appropriate library organizational structure	1.7	56	25	12	5	1
Library patron technophobia	1.6	51	37	10	<1	1
Library staff technophobia	1.5	58	30	9	2	1

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

*I.e., 2% of respondents reported that insufficient funds are not an impediment to the expansion of automation in their library.

Source: Library questionnaire, question 31.

Exhibit VI-16

MEAN RATINGS, PERCEIVED IMPEDIMENTS TO THE EXPANSION OF AUTOMATION IN THE LIBRARY, BY TYPE OF INSTITUTION

(Listed in Descending Order of "All Institutions" Mean Ratings)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Insufficient funds	3.5	▴3.4	3.6	3.6	3.5	3.6	—	3.6
Lack of space	2.3	▴2.3	▴2.2	2.5	▴2.3	▴2.7	—	2.5
Complicated user interfaces	▴2.6	▴2.5	2.2	▴2.4	2.1	2.2	—	2.2
Copyright issues	▴3.0	▴2.7	▴2.4	2.3	2.2	▴2.0	—	2.2
Lack of strategic planning	▴1.7	▴1.9	2.1	2.0	2.0	▴2.2	—	2.1
Lack of staff who can provide training in use of electronic media	2.0	▴1.8	2.1	2.1	2.1	▴2.2	—	2.1
Incompatible or inappropriate hardware/software	2.2	▴2.3	2.1	2.0	2.1	2.1	—	2.1
Lack of network access	▴1.6	▴1.6	▴1.8	2.1	2.0	▴2.3	—	2.1
Lack of top administrators' interest in expanded automation of the library	▴1.7	▴1.7	▴1.7	▴1.9	2.0	▴2.3	—	2.0
Inadequate library staff computer skills	▴2.2	1.9	2.0	1.9	▴1.9	2.1	—	2.0
Inadequate library patron computer skills	▴2.3	2.0	2.1	▴1.9	▴1.8	2.1	—	2.0
Lack of staff knowledgeable about electronic media (such as online resources, CD-ROMs, networks, etc.)	1.8	▴1.5	1.7	1.7	1.7	▴1.9	—	1.8
Lack of appropriate library organizational structure	1.7	1.7	1.7	▴1.5	▴1.5	▴1.8	—	1.7
Library patron technophobia	▴1.8	1.6	1.6	1.5	1.5	1.6	—	1.6
Library staff technophobia	▴1.7	1.6	1.6	1.5	1.5	1.6	—	1.5

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

▴This mean is statistically significantly different from that for all other types of schools combined ($p < .05$).

—Too few respondents to provide a reliable estimate.

Source: Library questionnaire, question 31.

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EXPECTATIONS REGARDING FUTURE EXPENDITURES

Two-thirds or more of the Library questionnaire respondents expect that, over the next 3 years, their institution's expenditures will increase for CD-ROM holdings (83 percent), training and equipment for library patrons to use electronic media (72 percent), access to online or CD-ROM bibliographic resources (68 percent), videotape holdings (68 percent), and training and equipment for library staff to use electronic media (66 percent) (Exhibit VI-17). Sixty percent expect expenditures to increase for access to online or CD-ROM full-text resources, such as NEXIS, but 15 percent have no idea about expenditures in this area.

Expenditures for the other items listed are expected to increase by about half or fewer of the respondents, and sizable percentages have no idea whether expenditures will increase or decrease. The "have no idea" figures are especially large (27 to 33 percent) for digitization of text, digitization of

Exhibit VI-17

EXPECTATIONS REGARDING EXPENDITURES OVER THE NEXT 3 YEARS

(Listed in Descending Order of the Percentage Expecting an Increase)

	Doesn't Apply: Not a Current or Likely Future Area of Expenditures	Increase	Stay the Same	Decrease	Have No Idea
Holdings of CD-ROMs	3*	83	9	3	3
Training and equipment for library patrons to use electronic media	3	72	21	1	4
Access to online or CD-ROM bibliographic resources, such as DIALOG or ERIC	5	68	19	4	5
Holdings of videotapes	5	68	21	2	4
Training and equipment for library staff to use electronic media	3	66	25	2	3
Access to online or CD-ROM full-text resources, such as NEXIS	11	60	12	2	15
Subscriptions to electronic journals	16	48	14	1	21
Holdings of computer software (other than CD-ROMs) for patrons' use	17	44	23	3	13
Digitization of text	35	28	6	1	31
Digitization of sound recordings and/or images	38	22	7	<1	33
Production of electronic publications	48	13	12	<1	27

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*I.e., 3% of respondents reported that CD-ROMs are not a current or likely future area of expenditures.

Source: Library questionnaire, question 30.

sound recordings and/or images, and production of electronic publications. It is likely that many respondents are not familiar with these processes.

There are substantial differences by institutional type on most of these items (except for CD-ROMs and other computer software), especially with regard to digitization of text and sound/images (Exhibit VI-18). For example, percentages that expect expenditures for digitization of text to increase range from a high of 76 percent of public doctoral institutions to a low of 18 percent of public 2-year institutions. In general, the public comprehensives, private doctorals, and, especially, the public doctorals are more likely than average to expect expenditures to increase.

Exhibit VI-18

PERCENTAGES OF INSTITUTIONS THAT EXPECT THAT EXPENDITURES WILL INCREASE OVER THE NEXT 3 YEARS, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	Public 2-Year	Private 2-Year	All Inst's
Holdings of CD-ROMs	85*	77	▲88	87	84	▲79	87	83
Training and equipment for library **patrons** to use electronic media	▲92	▲88	▲80	75	▲78	▲61	—	72
Access to online or CD-ROM bibliographic resources, such as DIALOG or ERIC	▲89	70	▲81	71	72	▲56	70	68
Holdings of videotapes	▲52	▲45	63	69	▲73	66	▲85	68
Training and equipment for library **staff** to use electronic media	▲87	▲82	69	73	71	▲56	—	66
Access to online or CD-ROM full-text resources, such as NEXIS	▲89	▲70	▲74	63	60	▲50	▲49	60
Subscriptions to electronic journals	▲90	▲78	55	46	44	▲41	49	48
Holdings of computer software other than CD-ROMs for patrons' use	50	41	49	38	47	40	—	44
Digitization of text	▲76	▲64	▲46	27	26	▲18	—	28
Digitization of sound recordings and/or images	▲51	▲52	▲36	17	23	▲14	—	22
Production of electronic publications	▲45	▲38	▲22	▲8	9	▲9	—	13

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*I.e., 85% of public doctoral respondents believe that their institution's expenditures for holdings of CD-ROMs will increase over the next 3 years.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

—Too few respondents to provide a reliable estimate.

Source: Library questionnaire, question 30.

VII. USE OF COMPUTERS AND AVM INSTRUCTIONAL TECHNOLOGIES IN TEACHER EDUCATION DEPARTMENTS AND BY EDUCATION FACULTY AND STUDENTS

INTRODUCTION

This chapter covers uses of audio, video, multimedia, and computer technologies in teacher education departments (or schools) and by education faculty and students. Data reported in this chapter are based on responses to the Teacher Education, Faculty, and Student questionnaires.

Among the 1,000 schools in the overall survey sample, 599 were identified as offering majors and/or degrees in teacher education. Completed Teacher Education questionnaires were received from 429 institutions, including 24 2-year schools (21 public and 3 private). Because there are so few 2-year-school responses and because their teacher education course offerings tend to be much more limited than those offered in 4-year schools, they have been excluded from the analyses reported here. The final teacher education data set includes 405 responses, distributed as follows across the five types of 4-year schools:

Public doctoral	74
Private doctoral	37
Public comprehensive	108
Private comprehensive	90
Liberal arts	96

Education faculty data reported here are based on responses from 216 faculty members in departments or schools of education at 58 of the 70 4-year institutions included in the faculty sample. (The two faculty respondents who are in education departments at 2-year schools are not included.) Education student data reported here are based on responses from 79 students who reported they were Education majors (other than physical education, basic education, or continuing education) and that they attended a 4-year school.[1] Note that neither the faculty nor student "education" respondents are necessarily in teacher education. See Chapter II for a more detailed description of the institutional and faculty samples and respondents and definitions of the various types of institutions discussed below.

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[1] Because of the small size of the Education student sample, these results should be interpreted with caution. Note also that because of the relatively small sample sizes for all types of respondents in this section, larger percentage differences typically are required for statistical significance.

TYPES OF TEACHER EDUCATION STUDENTS

Almost all of the institutions (92 percent) that returned the Teacher Education questionnaire have teacher education programs that include undergraduates, and about 7 in 10 (71 percent) have programs that include graduate students (Exhibit VII-1).[2] Equal percentages (61 percent) have pre-service graduate students and in-service graduate students. Across the five types of 4-year schools, private doctoral universities are less likely than others to include undergraduates in their teacher education program (76 percent vs. 91 to 94 percent), whereas liberal arts schools are the least likely to have graduate students (46 percent vs. 79 to 99 percent). In the remainder of this chapter, the results presented are based on those schools that have each type of students (graduate or undergraduate).

Exhibit VII-1

TYPES OF TEACHER EDUCATION STUDENTS ENROLLED DURING THE 1993 FALL TERM, BY TYPE OF INSTITUTION

(4-Year Institutions Only)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	All 4-Year Institutions
Undergraduate students majoring in teacher education	91*	▲76	94	92	93	92
Pre-service teacher education graduate students (those who have not taught for pay, either full-time or part-time, in a school setting)	▲91	▲86	▲78	66	▲34	61
In-service teacher education graduate students (those who have had at least some experience teaching for pay in a school setting)	▲92	▲81	▲78	▲72	▲31	61
Any teacher education graduate students	▲99	▲92	▲86	▲79	▲46	71

*I.e., 91% of public doctoral institutions with teacher education programs currently have undergraduate students majoring in teacher education.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Teacher Education questionnaire, question 1.

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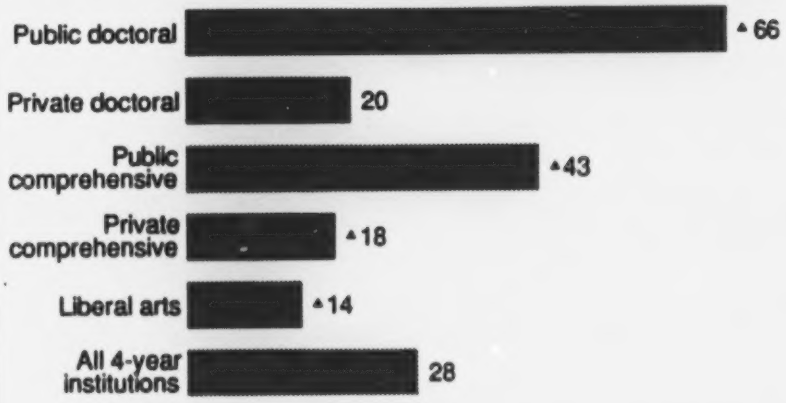
[2] The Teacher Education questionnaire instructed respondents that questions about students were "concerned exclusively with teacher education students—that is, students who are preparing to become teachers."

DISTANCE EDUCATION COURSES

About a fourth (28 percent) of the institutions that have teacher education programs offer distance education courses to in-service teacher education students, but this is far more common at public schools than at private schools (Exhibit VII-2). For example, two-thirds (66 percent) of the public doctoral institutions offer these distance education courses, compared with only a fifth (20 percent) of the private doctoral institutions. Among the education faculty, 9 percent reported that they taught a for-credit distance education course during the 1993 Fall Term.

Exhibit VII-2

PERCENTAGE OF 4-YEAR INSTITUTIONS THAT OFFER DISTANCE EDUCATION COURSES TO IN-SERVICE TEACHER EDUCATION STUDENTS, BY TYPE OF INSTITUTION



▲This percentage is statistically significantly different from that for all other types of schools combined (p < .05).

Source: Teacher Education questionnaire, question 2.

TRAINING IN INSTRUCTIONAL USES OF COMPUTERS

Almost all schools (96 percent) offer some kind of training in the instructional uses of computers to at least some of their teacher education students. This percentage ranges from 94 percent of liberal arts colleges to 100 percent of public doctoral universities. Of those that offer this training, the vast majority (83 percent) integrate at least some of it with other teacher education courses.

Training in Instructional Uses of Computers Provided to Undergraduates

The Teacher Education questionnaire provided a list of 11 types of training in instructional uses of computers that might be provided to students. Respondents were asked to indicate which of these are offered as an elective to at least some undergraduate teacher education majors and to at least some graduate teacher education students and which types are required of at least some of each type of students. The results with regard to undergraduates are presented in Exhibits VII-3 (overall results for both offered and required training), VII-4 (results by type of institution for required training), and VII-5 (results by type of institution for training offered as an elective).

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Three-fourths of schools (75 percent) require at least some of the listed kinds of computer-use training, and a comparable percentage (77 percent) offer some kinds of training as an elective. Most commonly required are training in use of instructional software (at 66 percent of schools) and training in integrating computer use with overall instructional methods (59 percent). Integrating computer use with overall curriculum content, required by 50 percent of schools, is somewhat less common. Also required by a majority of schools are training in selecting instructional software (57 percent), use of computers in instructional management (53 percent), and use of computers for delivery of programmed instruction (52 percent). Most of these are more likely to be required than offered as an elective. This is especially true for integrating computer use with overall curriculum content, which is offered as an elective by only 17 percent of schools. In contrast, types of training that are required at fewer than half of the schools are more likely to be offered as an elective. For example, accessing and using networks is required at 33 percent of schools but offered as an elective at 42 percent. Overall, with the exception of training in integrating computer use with curriculum content, there is less variability in the percentages of institutions that offer various topics as an elective (30 to 53 percent) than in those that require them (23 to 66 percent).

Exhibit VII-3

PERCENTAGE OF 4-YEAR INSTITUTIONS THAT OFFER AND REQUIRE VARIOUS KINDS OF COMPUTER-USE TRAINING FOR UNDERGRADUATE TEACHER EDUCATION STUDENTS

(Listed in Descending Order of Percent Required)

	Offered as an Elective to at Least Some	Required of at Least Some
Use of instructional software	53*	66
Integrating computer use with overall instructional methods	50	59
Selecting instructional software	47	57
Use of computers in instructional management, such as testing, record-keeping, planning individualized instruction, etc.	48	53
Use of computers for delivery of programmed instruction, such as tutorials, drill and practice, etc.	50	52
Integrating computer use with overall curriculum content	17	50
Use of computers for interactive control of audio or video materials	40	33
Accessing and using networks, such as Internet, FredMail, Learning Link, etc.	42	33
Using databases accessed by computer networks	40	27
Managing multiple small groups of students using computers	30	27
Developing courseware for instruction in classrooms, such as building HyperCard stacks	36	23
None of the above	23	25

---

*I.e., 53% of 4-year institutions offer training in the use of instructional software as an elective to at least some undergraduate teacher education students.

Source: Teacher Education questionnaire, question 5.

There are relatively few statistically significant differences by institutional type in the percentages of institutions that require at least some students to take the various types of computer-use training (Exhibit VII-4). Where there are differences, the public comprehensive schools usually are more likely than others to require a given type of training,[3] and the liberal arts schools are less likely than others to do so. The largest differences are on training in accessing and using networks. The percentages that require this type of training of at least some undergraduates range from a low of 22 percent of liberal arts schools to 47 percent of public comprehensive schools.

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[3] On "use of computers for interactive control...," the percentage of private doctorals that require training is actually higher than the percentage of public comprehensives (46 vs. 44 percent), yet the former is not statistically significantly different from the others. This apparent anomaly occurs because the small private doctoral sample (n=37) requires larger percentage differences to achieve statistical significance than does the larger public comprehensive sample (n=108).

Exhibit VII-4

PERCENTAGE OF 4-YEAR INSTITUTIONS THAT REQUIRE VARIOUS KINDS OF COMPUTER-USE TRAINING OF AT LEAST SOME UNDERGRADUATE TEACHER EDUCATION STUDENTS, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	All 4-Year Institutions
Use of instructional software	73*	68	65	63	66	66
Integrating computer use with overall instructional methods	67	64	58	60	56	59
Selecting instructional software	58	57	▲65	54	52	57
Use of computers in instructional mgmt, such as testing, record-keeping, planning individualized instruction, etc.	▲64	50	57	59	▲45	53
Use of computers for delivery of programmed instruction, such as tutorials, drill and practice, etc.	49	54	58	49	48	52
Integrating computer use with overall curriculum content	58	61	48	47	48	50
Use of computers for interactive control of audio or video materials	31	46	▲44	29	28	33
Accessing and using networks, such as Internet, FredMail, Learning Link, etc.	39	43	▲47	33	▲22	33
Using databases accessed by computer networks	34	25	▲38	29	▲17	27
Managing multiple small groups of students using computers	33	21	32	24	23	27
Developing courseware for instruction in classrooms, such as building HyperCard stacks	▲31	29	▲33	19	▲16	23
None of the above	19	21	23	25	29	25

---

*I.e., 73% of public doctoral institutions require training in the use of instructional software of at least some undergraduate teacher education students.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Teacher Education questionnaire, question 5.

In contrast to the relatively few differences by institutional type in training requirements, there are many differences in the electives offered (Exhibit VII-5). There are statistically significant differences among the types of institutions on all of the items. On most, public doctoral institutions are more likely than others to offer the training as an elective. The largest differences are on selecting instructional software (32 to 64 percent) and managing multiple small groups of students using computers (14 to 51 percent). On both these items, private doctoral institutions are the least likely to offer it as an elective, and public doctoral institutions are the most likely.

Exhibit VII-5

PERCENTAGE OF 4-YEAR INSTITUTIONS THAT OFFER VARIOUS KINDS OF COMPUTER-USE TRAINING AS AN ELECTIVE TO UNDERGRADUATE TEACHER EDUCATION STUDENTS, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	All 4-Year Institutions
Use of instructional software	▲64*	46	▲60	46	48	53
Integrating computer use with overall instructional methods	▲64	39	▲58	42	46	50
Selecting instructional software	▲64	▲32	50	46	43	47
Use of computers in instructional management, such as testing, record-keeping, planning individualized instruction, etc.	▲58	39	▲57	▲39	46	48
Use of computers for delivery of programmed instruction, such as tutorials, drill and practice, etc.	▲60	39	▲62	▲41	46	50
Integrating computer use with overall curriculum content	▲24	14	21	13	14	17
Use of computers for interactive control of audio or video materials	▲55	32	▲49	36	▲33	40
Accessing and using networks, such as Internet, FredMail, Learning Link, etc.	▲61	39	44	46	▲33	42
Using databases accessed by computer networks	▲58	32	39	40	37	40
Managing multiple small groups of students using computers	▲51	▲14	33	▲23	29	30
Developing courseware for instruction in classrooms, such as building HyperCard stacks	▲52	36	39	37	▲29	36
None of the above	▲13	32	▲17	28	25	23

---

*I.e., 64% of public doctoral institutions offer training in the use of instructional software as an elective to at least some of their undergraduate teacher education students.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Teacher Education questionnaire, question 5.

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Training in Instructional Uses of Computers Provided to Graduate Students

Unlike the situation with undergraduates, all types of computer use training are more likely to be offered as an elective to graduate students than to be required (Exhibit VII-6). Overall, three-fourths of the schools (74 percent) offer at least one type of computer-use training as an elective to graduate students, whereas only half (49 percent) require any. The most commonly required training (as with undergraduates) is use of instructional software, required of at least some graduate students at 39 percent of the schools. All other types are required by no more than about a third of the schools, and in each case the percentage that require the training of graduate students is at least somewhat lower than the percentage that require it of undergraduates. However, the percentages of schools that offer the various types of training as an elective to graduate students typically are about the same as the percentages that offer them to undergraduates. The single exception is training in integrating computer use with overall curriculum content, which is offered as an elective to graduate students by 46 percent of institutions (vs. 17 percent who offer it to undergraduates).

Exhibit VII-6

PERCENTAGE OF 4-YEAR INSTITUTIONS THAT OFFER AND REQUIRE VARIOUS KINDS OF COMPUTER-USE TRAINING FOR GRADUATE TEACHER EDUCATION STUDENTS

(Listed in Descending Order of Percent Required)

	Offered as an Elective to at Least Some	Required of at Least Some
Use of instructional software	51*	39
Selecting instructional software	45	34
Use of computers in instructional management, such as testing, record-keeping, planning individualized instruction, etc.	52	33
Integrating computer use with overall instructional methods	49	33
Use of computers for delivery of programmed instruction, such as tutorials, drill and practice, etc.	46	32
Integrating computer use with overall curriculum content	46	30
Use of computers for interactive control of audio or video materials	40	22
Using databases accessed by computer networks	41	22
Accessing and using networks, such as Internet, FredMail, Learning Link, etc.	48	21
Managing multiple small groups of students using computers	33	18
Developing courseware for instruction in classrooms, such as building HyperCard stacks	40	16
None of the above	26	51

---

*I.e., 51% of 4-year institutions offer use of instructional software as an elective to at least some of their teacher education graduate students.

Source: Teacher Education questionnaire, question 5.

Across institutional types, the percentages that require at least some graduate students to take one or more kinds of computer-use training range from 39 percent of liberal arts schools to 68 percent of private doctoral schools (Exhibit VII-7). There are statistically significant differences on 7 of the 11 items. On these items, public and/or private doctoral schools are the most likely to require training, and liberal arts schools tend to be the least likely to do so. The biggest difference is on accessing and using networks, training in which is provided by only 5 percent of liberal arts schools but by 41 percent of private doctoral schools. Other types of training with relatively large differences by institutional type (with lows and highs of each) are: integrating computer use with overall instructional methods (25 percent of liberal arts schools, 47 percent of private doctoral schools), using databases accessed by computer networks (9 percent of liberal arts schools, 30 to 32 percent of doctoral and public comprehensive schools), and developing courseware (7 percent of liberal arts schools, 29 percent of doctoral schools).

Exhibit VII-7

PERCENTAGE OF 4-YEAR INSTITUTIONS THAT REQUIRE VARIOUS KINDS OF COMPUTER-USE TRAINING OF AT LEAST SOME GRADUATE TEACHER EDUCATION STUDENTS, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	All 4-Year Institutions
Use of instructional software	44*	41	40	46	32	39
Selecting instructional software	38	41	41	39	▴23	34
Use of computers in instructional management, such as testing, record-keeping, planning individualized instruction, etc.	41	41	33	37	27	33
Integrating computer use with overall instructional methods	40	▴47	33	▴43	25	33
Use of computers for delivery of programmed instruction, such as tutorials, drill and practice, etc.	33	32	35	36	27	32
Integrating computer use with overall curriculum content	34	41	29	37	23	30
Use of computers for interactive control of audio or video materials	27	▴35	23	24	16	22
Using databases accessed by computer networks	▴30	32	▴30	29	▴9	22
Accessing and using networks, such as Internet, FredMail, Learning Link, etc.	▴33	▴41	▴32	24	▴5	21
Managing multiple small groups of students using computers	▴27	21	20	17	14	18
Developing courseware for instruction in classrooms, e.g., building HyperCard stacks	▴29	▴29	21	17	▴7	16
None of the above	42	▴32	49	44	▴61	51

---

*I.e., 44% of public doctoral institutions require training in the use of instructional software of at least some graduate teacher education students.

▴This percentage is statistically significantly different from that for all other types of schools combined (p < .05).

Source: Teacher Education questionnaire, question 5.

As with undergraduates, there are many differences by institutional type in the percentages that offer training as an elective to graduate students (Exhibit VII-8). Public comprehensive and, especially, public doctoral schools tend to be the most likely to offer training of various types as an elective, and, once again, liberal arts schools tend to be the least likely to do so. On three of the items, the range of percentages is 40 points or more, and on four others it is between 30 and 40.

Exhibit VII-8

PERCENTAGE OF 4-YEAR INSTITUTIONS THAT OFFER VARIOUS KINDS OF COMPUTER-USE TRAINING AS AN ELECTIVE TO GRADUATE TEACHER EDUCATION STUDENTS, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	All 4-Year Institutions
Use of instructional software	▲68*	59	▲63	47	▲39	51
Use of computers in instructional management, such as testing, record-keeping, planning individualized instruction, etc.	60	50	▲71	49	▲39	52
Selecting instructional software	▲66	56	▲54	44	▲32	45
Integrating computer use with overall instructional methods	▲66	56	▲62	▲37	41	49
Use of computers for delivery of programmed instruction, such as tutorials, drill and practice, etc.	▲59	50	▲58	41	▲36	46
Integrating computer use with overall curriculum content	▲59	56	▲59	37	▲36	46
Use of computers for interactive control of audio or video materials	▲63	50	▲57	34	▲23	40
Using databases accessed by computer networks	▲67	47	▲50	36	▲30	41
Accessing and using networks, such as Internet, FredMail, Learning Link, etc.	▲77	56	55	44	▲34	48
Managing multiple small groups of students using computers	▲55	▲21	39	31	25	33
Developing courseware for instruction in classrooms, such as building HyperCard stacks	▲66	▲53	▲53	39	▲23	40
None of the above	▲10	18	▲16	30	▲36	26

---

*I.e., 68% of public doctoral institutions offer training in the use of instructional software as an elective to at least some graduate teacher education students.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Teacher Education questionnaire, question 5.

Computer-Use Training Requirements for Teacher Education Specialties

As shown in Exhibit VII-9, almost all of the schools offer programs that allow teacher education students to specialize in elementary school education (91 percent), secondary school education (91 percent), adult basic education (91 percent), and special education (84 percent). Six in 10 of the schools (60 percent) offer programs in early childhood or preschool education.

Of those that offer each type of program, large majorities (71 to 80 percent) require undergraduates in early childhood, elementary, and secondary education programs to receive training in instructional uses of computers. In contrast, only 37 percent require undergraduates in special education to receive such training, and almost none (3 percent) require either undergraduates or graduate students in adult basic education to do so.

Exhibit VII-9

PERCENTAGE OF 4-YEAR INSTITUTIONS THAT REQUIRE COMPUTER-USE TRAINING FOR STUDENTS IN VARIOUS TEACHER EDUCATION SPECIALTIES

	Percentage of Institutions That Offer a Program In This Specialty	Percentage That Require Training In Instructional Uses of Computers[a]	
		Undergraduate Majors	Graduate Students
Early childhood/preschool	60[*]	71	26
Elementary school	91	80	34
Secondary school	91	74	33
Adult basic education	91	3	3
Special education	84	37	22

---

[*] I.e., 60% of 4-year institutions offer a program for teacher education students to specialize in early childhood/preschool education.

[a] Of those institutions that offer a program in the specialty and have undergraduate/graduate students.

Source: Teacher Education questionnaire, question 6.

As would be expected given the findings discussed above about overall computer-use training requirements for graduate students, considerably fewer schools require graduate students in the various specialties (except adult basic education) to receive computer-use training. Twenty-six to 34 percent require those specializing in early childhood, elementary, or secondary education to receive training, and 22 percent require those specializing in special education to do so.

Hours of Training in Instructional Uses of Computers Required and Taken

A fourth of the schools (26 percent) reported that, on average, undergraduate teacher education majors are not required to take any hours of training in instructional uses of computers, and slightly over half (56 percent) require no computer-use training of the average graduate student (Exhibit VII-10). Also, an average of 21 hours or more are required of graduate students at only 26 percent of the schools, compared with 50 percent that require this many hours for undergraduates. Estimates of average hours of training usually taken by graduate students and undergraduates are somewhat closer: 31 percent estimated that graduate students average 21 or more hours of training, and 42 percent

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estimated that undergraduates actually take this much training. Notice also that for undergraduates the "required" and "actually taken" hours are quite similar, whereas graduate students seem to be somewhat more likely to take training that is not required.

Exhibit VII-10

HOURS[a] OF TRAINING IN INSTRUCTIONAL USES OF COMPUTERS REQUIRED AND USUALLY TAKEN BY TEACHER EDUCATION STUDENTS

	Hours Required		Hours Usually Taken	
	Undergraduate Majors	Graduate Students	Undergraduate Majors	Graduate Students
None	26*	56	24	33
1 to 20	23	15	30	32
21 to 50	37	20	28	22
51 to 80	10	5	10	7
More than 80	3	1	4	2
Have no idea	1	2	3	5

---

*I.e., 26% of 4-year institutions do not require undergraduate teacher education majors to take any training in instructional uses of computers.

[a] Defined as "actual hours of training, not credit hours."

Source: Teacher Education questionnaire, questions 7 and 8.

FACULTY AND STUDENT COMPUTER USE AND AVAILABILITY

Faculty Computer Use

According to self-reports, education faculty at 4-year schools are about average in the frequency with which they use computers for research or instruction-related purposes. Sixty-nine percent reported that they use computers more than once a week or daily (Exhibit VII-11), compared with an overall figure of 74 percent for all types of faculty in 4-year schools. (These percentages are not statistically significantly different from each other.) Half of the education faculty (50 percent) use a computer daily.

Exhibit VII-11

FREQUENCY WITH WHICH FACULTY USED COMPUTERS FOR INSTRUCTIONAL OR RESEARCH PURPOSES DURING THE 1993 FALL TERM

(Faculty in 4-Year Institutions Only)

	Never	Once or Twice	Less than Once a Week	About Once a Week	More than Once a Week	Daily
Education faculty	6*	7	5	13	19	50
All faculty in 4-year schools	8	5	5	8	18	56

*I.e., 6% of teacher education faculty in 4-year institutions reported that they never used a computer for instructional or research purposes during the 1993 Fall Term.

Source: Faculty questionnaire, question 17.

Estimates of faculty use by respondents to the Teacher Education questionnaire are considerably lower. Only 44 percent of these respondents estimated that 75 percent or more of their teacher education faculty use computers more than once a week (Exhibit VII-12). Forty-two and 43 percent of the comprehensive and liberals arts schools estimated this level of use, compared with 54 and 59 percent of the public and private doctoral schools, respectively. It is not clear why the differences between self-report and institutional estimates occurred (they are similar to the differences between self-report and CAO and Computer questionnaire estimates reported in Chapter III). They do not seem to be explained by variability among institutional types, because even the doctoral schools' estimates are lower than would be expected from the self-reports.

Exhibit VII-12

ESTIMATED PERCENTAGES OF TEACHER EDUCATION FACULTY WHO USE COMPUTERS MORE THAN ONCE A WEEK FOR INSTRUCTIONAL OR RESEARCH PURPOSES

(4-Year Institutions Only)

Fewer than 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
15*	20	19	19	26	1

*I.e., 15% of 4-year institutions with teacher education programs estimated that fewer than 25% of their teacher education faculty use computers more than once a week for instructional or research purposes.

Source: Teacher Education questionnaire, question 11.

As shown in Exhibit VII-13, slightly over a third of the education faculty (36 percent) reported that during the 1993 Fall Term they used a computer in the classroom to give a demonstration or presentation, and 31 percent used a room that has computers for individual student use to teach one or more class sessions. Both of these percentages are somewhat higher than those for other faculty in

4-year schools (26 and 23 percent, respectively). Only about half as many of either group (14 percent of education faculty and 11 percent of other faculty) used a classroom that was specially designed to provide for computer-controlled integration of technologies such as videodisc players, VCRs, and projection equipment.

Exhibit VII-13

PERCENTAGES OF EDUCATION FACULTY AND OTHER 4-YEAR-SCHOOL FACULTY WHO USED COMPUTERS IN EACH LISTED WAY IN AN ON-CAMPUS COURSE DURING THE 1993 FALL TERM

	Education Faculty	Other Faculty	All Faculty in 4-Year Institutions
Used a computer in the classroom to give a demonstration or presentation	▲36	▲26	27
Used a room that has computers for individual student use to teach one or more class sessions	▲31	▲23	24
Used a classroom that was specially designed to provide for computer-controlled integration of technologies such as videodisc players, VCRs, and projection equipment	14	11	11

---

*I.e., 36% of teacher education faculty reported that during the 1993 Fall Term they used a computer in the classroom to give a demonstration or presentation.

▲This percentage is statistically significantly different from the other group of faculty ($p < .05$).

Source: Faculty questionnaire, question 23.

On a similar question, about a third (31 percent) of Teacher Education questionnaire respondents estimated that more than 50 percent of their education faculty used computers in an on-campus course during the 1993 Fall Term (Exhibit VII-14). At the opposite end of the scale, 16 percent estimated that fewer than 10 percent of their faculty used computers in a course. There are few differences by institutional type on this question.

Exhibit VII-14

ESTIMATED PERCENTAGES OF EDUCATION FACULTY WHO USED COMPUTERS IN AN ON-CAMPUS COURSE DURING THE 1993 FALL TERM

(4-Year Institutions Only)

	None	Fewer than 10%	10% to 25%	26% to 50%	More than 50%	Have No Idea
Use of computers	1*	16	32	19	31	1

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*I.e., 1% of 4-year institutions with teacher education programs estimated that none of their education faculty used computers in any of their on-campus courses during the 1993 Fall Term.

Source: Teacher Education questionnaire, question 18.

Student Computer Use

As with education faculty, students majoring in education are about average in the frequency of their overall use of computers to do school work. Among the student respondents who are education majors at 4-year schools, 45 percent reported that during the past term they used a computer more than once a week to do school work. Among all students at 4-year schools, the figure is 51 percent. Half of the Teacher Education questionnaire respondents (52 and 50 percent) estimated that 50 percent or more of their graduate students and undergraduate majors (respectively) use computers more than once a week for instructional or research purposes (Exhibit VII-15).

Exhibit VII-15

ESTIMATED PERCENTAGES OF TEACHER EDUCATION STUDENTS WHO USE COMPUTERS MORE THAN ONCE A WEEK FOR INSTRUCTIONAL OR RESEARCH PURPOSES

(4-Year Institutions Only)

	Fewer than 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
Undergraduate majors	18*	27	25	15	10	5
Graduate students	18	21	28	14	10	9

---

*I.e., 18% of 4-year institutions with teacher education programs estimated that fewer than 25% of their teacher education undergraduate majors use computers more than once a week for instructional or research purposes.

Source: Teacher Education questionnaire, question 11.

Network Activities

Almost half of the schools (45 percent) reported that their school or department of education has organized some kind of electronic network service (e-mail, electronic bulletin board, etc.) through which current students, alumni, teachers, and/or others can share problems, discuss instructional issues, and so on (Exhibit VII-16). As might be expected, given the relatively low level of network access among liberal arts colleges (see Chapter IV), these schools are the least likely to have organized such a service.

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Exhibit VII-16

PERCENTAGE OF TEACHER EDUCATION SCHOOLS/DEPARTMENTS THAT HAVE ORGANIZED AN ELECTRONIC NETWORK SERVICE, BY TYPE OF INSTITUTION

(4-Year Institutions Only)

Public Doctoral	Private Doctoral	Public Comprehensive	Private Comprehensive	Liberal Arts	All 4-Year Institutions
▲66*	▲62	▲58	40	▲29	45

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*I.e., 66% of public doctoral schools/departments of education have organized some kind of electronic network service for current students, alumni, teachers, and/or others.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Teacher Education questionnaire, question 10.

Reported access to and use of e-mail by education faculty are average among 4-year-school faculty (Exhibit VII-17). For example, 82 percent of education faculty reported that they have an e-mail account or access to e-mail, compared with 79 percent of other 4-year-school faculty. Similar percentages of education and non-education faculty also engaged in e-mail and computer conferencing activities and required their students to engage in these activities.

Exhibit VII-17

E-MAIL/COMPUTER CONFERENCING ACCESS AND USE BY EDUCATION AND NON-EDUCATION FACULTY

	Education Faculty	Other Faculty	All Faculty in 4-Year Institutions
Have an e-mail account or access to e-mail	82*	79	80
Used e-mail or computer conferencing to communicate with colleagues during the 1993 Fall Term	61	61	61
Used e-mail or computer conferencing to communicate with students during the 1993 Fall Term	36	37	36
Required students to use e-mail or computer conferencing to communicate with themselves during the 1993 Fall Term	11	8	9
Required students to use e-mail or computer conferencing to communicate with other students during the 1993 Fall Term	8	5	6

---

*I.e., 82% of teacher education faculty reported that they have an e-mail account or access to e-mail.

Source: Faculty questionnaire, questions 11, 20, and 21.

In contrast, use of e-mail by education students is considerably below average, especially for school-related activity (Exhibit VII-18). A fourth (26 percent) of education majors reported that they sent or received e-mail messages during the past term, compared with 44 percent of other students at 4-year schools. Fewer than 10 percent of education students used e-mail during the past term to communicate with instructors (8 percent) or other students (9 percent) about school work, compared with 24 and 21 percent, respectively, of non-education students in 4-year schools.

Exhibit VII-18

E-MAIL/COMPUTER CONFERENCING ACCESS AND USE BY EDUCATION AND NON-EDUCATION STUDENTS

	Education Students	Other Students	All Students in 4-Year Institutions
Sent or received e-mail messages during the past term	▲26*	▲44	42
Used e-mail during the past term to communicate with instructors about school work	▲8	▲24	22
Used e-mail during the past term to communicate with other students about school work	▲9	▲21	20

---

*I.e., 26% of students majoring in education reported that they sent or received e-mail messages during the past term.

▲This percentage is statistically significantly different from the other group of students ($p < .05$).

Source: Student questionnaire, questions 39, 40, and 41.

Availability of PCs to Faculty

Eighty-three percent of education faculty reported that their institution provides a PC for their sole use, somewhat higher than the percentage for non-education faculty at 4-year schools (74 percent). Respondents to the Teacher Education questionnaire likewise reported higher levels of PC availability for education faculty than did Computer questionnaire respondents for all faculty at 4-year schools (Exhibit VII-19). Overall, 66 percent of Teacher Education respondents estimated that the institution provides 75 percent or more of education faculty with a PC, compared with 49 percent of Computer respondents regarding all 4-year-school faculty. The largest differences are in the public doctoral universities, where the figures are 83-percent for education faculty and 43-percent for all faculty.

Exhibit VII-19

PERCENTAGE OF INSTITUTIONS THAT PROVIDE A SOLE-USE PC FOR EDUCATION AND OVERALL FACULTY, BY TYPE OF INSTITUTION

(4-Year Institutions with Teacher Education Programs)

Proportion of Faculty Provided	Public Doctoral		Private Doctoral		Public Comp.		Private Comp.		Liberal Arts		All 4-Year Institutions	
Sole-Use Computer	Ed. Fac.	All Fac.	Ed. Fac.	All Fac.	Ed. Fac.	All Fac.	Ed. Fac.	All Fac.	Ed. Fac.	All Fac.	Ed. Fac.	All Fac.
Fewer than 25%	▲1*	▲6	▲3	7	12	▲5	16	6	▲21	▲21	15	11
25% to 49%	4	▲7	11	14	5	20	10	19	9	11	7	15
50% to 74%	11	▲41	11	32	11	22	11	▲15	11	25	11	24
75% to 90%	9	▲28	14	21	▲14	19	6	18	▲5	14	9	18
More than 90%	▲74	▲15	56	25	58	34	56	▲42	52	29	57	31
Have no idea	0	4	6	0	0	0	2	0	2	0	2	0

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*I.e., 1% of public doctoral institutions with teacher education programs estimated that the institution provides a microcomputer or workstation to fewer than 25% of its education faculty.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$) for education faculty or all faculty, as appropriate.

Sources: Teacher Education questionnaire, question 12.
Computer questionnaire, question 2.

Availability of PCs to Students

According to the Teacher Education questionnaire respondents, essentially all of the schools (98 percent) have microcomputers or workstations (PCs) available for out-of-class use by their teacher education students, and the vast majority (81 percent) have them available for class instructional time. Similarly, only 1 percent of education majors reported that they do not own or have access to a computer when they need one.

TRAINING IN INSTRUCTIONAL USES OF AVM TECHNOLOGIES

In the Teacher Education questionnaire, the audio, video, and multimedia (AVM) technologies were defined as follows:

> **Video technologies (carry picture and sound):** Broadcast, cable, or closed-circuit television; videocassettes; videodiscs; video projection systems.
>
> **Audio technologies (carry sound only):** audio cassettes, audiotapes, audio CDs, records, radio.
>
> **Multimedia:** Computer-mediated integration of text, audio, and/or video technologies—for example, microcomputers linked to and controlling videodisc players, CD ROMs, video/audio projection units, or slide or video digitizers.

The great majority of schools (82 percent) offer some kind of training in the instructional uses of AVM technologies to at least some of their teacher education students. (Note, however, that this percentage is smaller than the 96 percent that provide computer-use training.) Whereas the liberal arts schools are the least likely to teach computer use, the private doctoral schools are the least likely to teach AVM technology use. Sixty-eight percent of private doctoral schools do, compared with 77 percent of liberal arts schools, 84 percent of the private comprehensives, and 89 percent of the public doctorals and public comprehensives. Of the schools that offer this training, about two-thirds (69 percent) integrate at least some of it with other teacher education courses (fewer than the 83 percent that integrate at least some of the computer-use training with other courses).

Training in Instructional Uses of AVM Technologies Provided to Undergraduates

Questions about training in instructional uses of AVM technologies were parallel to those asked about computer-use training. The AVM technology list included 10 types of training. Exhibit VII-20 presents the overall percentages of schools that offer as an elective and require each type of training for undergraduate teacher education majors. A majority of the schools (61 percent) require at least some of the listed kinds of AVM technology training, and the same percentage offer some kinds as an elective. However, unlike computer-use training, few topics are required by many schools.

The two most commonly required types of training are both what are now considered relatively "low-tech" activities: training in the use of film, slide, or overhead projectors for instructional purposes (required by 57 percent of schools) and selecting audio and/or video programs for use in instruction, (47 percent). No more than a third of the schools require undergraduate training in any of the other topics. Only 32 percent require training in integrating AVM use with overall instructional methods and/or curriculum content, but an equivalent percentage (30 percent) reported that they require training in use of multimedia for classroom presentations. None of the other topics are required by more than a fifth of the schools. Except for the two most frequently required topics, the AVM technology topics are required less often than they are offered as an elective. Nevertheless, all of the topics are offered as an elective by fewer than 40-percent of the schools. As with the computer-use topics, there is less variability in the percentages of institutions that offer the various AVM technology topics as electives (11 to 39 percent) than in those that require them (4 to 57 percent).

There are few appreciable differences by institutional type in percentages that offer or require undergraduate training in these AVM technology topics. The only item with a percentage range of more than 20 points is integrating AVM use with overall instructional methods and/or curriculum content. Only 15 percent of the private doctoral schools offer this topic as an elective, compared with 31 percent of liberal arts schools, 35 percent of the private comprehensives, 45 percent of the public comprehensives, and 48 percent of the public doctorals.

Exhibit VII-20

PERCENTAGE OF 4-YEAR INSTITUTIONS THAT OFFER AND REQUIRE VARIOUS KINDS OF TRAINING IN INSTRUCTIONAL USES OF AUDIO, VIDEO, OR MULTIMEDIA TECHNOLOGIES TO UNDERGRADUATE TEACHER EDUCATION STUDENTS

(Listed in Descending Order of Percent Required)

	Offered as an Elective to at Least Some	Required of at Least Some
Use of film, slide, or overhead projectors for instructional purposes	36*	57
Selecting audio and/or video programs for use in instruction	35	47
Integrating audio, video, or multimedia use with overall instructional methods and/or curriculum content	37	32
Use of multimedia for classroom presentations	39	30
Producing or designing multimedia programs for use in instruction	31	19
Use of multimedia for self-paced, individualized instruction	25	19
Producing or designing audio programs for use in instruction	25	19
Producing or designing video programs for use in instruction	29	18
Use of live interactive television in instruction	21	11
Use of audio, video, or multimedia technologies for courses taught at a distance	11	4
None of the above	39	39

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*I.e., 36% of 4-year institutions offer as an elective training in the use of film, slide, or overhead projectors for instructional purposes to at least some undergraduate teacher education students.

Source: Teacher Education questionnaire, question 15.

Training in Instructional Uses of AVM Technologies Provided to Graduate Students

As with computer-use training, all types of AVM technology training are more likely to be offered as an elective to graduate students than to be required (Exhibit VII-21), but fewer schools offer or require any type of AVM of graduate students than do computer-use training. Overall, 51 percent offer at least one type of AVM technology training as an elective to graduate students, and 34 percent require at least one type. The most commonly required topics are use of projectors for instructional purposes (24 percent), use of multimedia for classroom presentations (22 percent), and integrating AVM use with overall instructional methods and/or curriculum content (22 percent). Each of these topics is offered as an elective by 31 to 35 percent of the schools. All other types are required by no more than a fifth of the schools. For every type of AVM technology training, the percentage of schools that require the training of graduate students is at least somewhat lower (and in some cases much lower) than the percentage that require it of undergraduates. The percentage of schools that offer a given type of training as an elective to graduate students typically is only slightly lower than the percentage that offer it to undergraduates.

Exhibit VII-21

PERCENTAGE OF 4-YEAR INSTITUTIONS THAT OFFER AND REQUIRE VARIOUS KINDS OF TRAINING IN INSTRUCTIONAL USES OF AUDIO, VIDEO, OR MULTIMEDIA TECHNOLOGIES TO GRADUATE TEACHER EDUCATION STUDENTS

(Listed in Descending Order of Percent Required)

	Offered as an Elective to at Least Some	Required of at Least Some
Use of film, slide, or overhead projectors for instructional purposes	31*	24
Use of multimedia for classroom presentations	35	22
Integrating audio, video, or multimedia use with overall instructional methods and/or curriculum content	34	22
Selecting audio and/or video programs for use in instruction	33	19
Producing or designing multimedia programs for use in instruction	32	15
Use of multimedia for self-paced, individualized instruction	26	14
Producing or designing video programs for use in instruction	26	11
Producing or designing audio programs for use in instruction	19	11
Use of live interactive television in instruction	20	7
Use of audio, video, or multimedia technologies for courses taught at a distance	14	2
None of the above	49	66

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*I.e., 31% of 4-year institutions offer as an elective training in the use of film, slide, or overhead projectors for instructional purposes to at least some graduate teacher education students.

Source: Teacher Education questionnaire, question 15.

There are no sizable differences by institutional type in the percentages of institutions that require graduate student training in the various AVM technology topics, but there are many differences in the percentages that offer the training as an elective. On all but one of the topics (use of projectors), there is at least a 20-point spread in the percentages of the five types of schools that offer that kind of training, with liberal arts schools consistently the least likely to offer the training and public comprehensive and public doctoral schools typically the most likely to offer it (Exhibit VII-22). The three multimedia topics (use in classroom presentations, use for self-paced individualized instruction, and production/design) produced the greatest differences, with lows of 14 to 19 percent and highs of 46 to 60 percent. Using live interactive television in instruction, using AVM technologies in distance education, and integrating AVM technologies with overall methods or content also produced differences of 30 points or more.

Exhibit VII-22

PERCENTAGE OF INSTITUTIONS THAT OFFER AS AN ELECTIVE TO AT LEAST SOME GRADUATE TEACHER EDUCATION STUDENTS TRAINING IN INSTRUCTIONAL USES OF AUDIO, VIDEO, OR MULTIMEDIA TECHNOLOGIES, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	All 4-Year Institutions
Use of film, slide, or overhead projectors for instructional purposes	39*	26	▲40	34	▲21	31
Use of multimedia for classroom presentations	▲60	▲47	▲44	36	▲19	35
Integrating audio, video, or multimedia use with overall instructional methods and/or curriculum content	▲51	35	▲48	31	▲21	34
Selecting audio and/or video programs for use in instruction	▲43	32	▲45	31	▲23	33
Producing or designing multimedia programs for use in instruction	▲58	▲47	▲46	26	▲16	32
Use of multimedia for self-paced individualized instruction	▲46	▲41	▲37	21	▲14	26
Producing or designing video programs for use in instruction	▲42	29	▲37	23	▲14	26
Producing or designing audio programs for use in instruction	▲29	18	▲30	17	▲9	19
Use of live interactive television in instruction	▲38	24	▲37	14	▲7	20
Use of audio, video, or multimedia technologies for courses taught at a distance	▲32	21	▲24	11	▲2	14
None of the above	▲25	38	▲37	47	▲67	49

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*I.e., 39% of public doctoral institutions offer as an elective training in the use of film, slide, or overhead projectors for instructional purposes to at least some teacher education graduate students.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Teacher Education questionnaire, question 15.

Hours of Training in Instructional Uses of AVM Technologies Required and Taken

About 7 in 10 schools (71 percent) do not require any hours of training in instructional uses of AVM technologies of their average graduate student in teacher education, whereas only 3 in 10 (29 percent) do not require any training of the average undergraduate major (Exhibit VII-23). Even among undergraduates, not a great deal of training typically is required. Only 20 percent of the schools require an average of more than 20 hours of training for their undergraduates (and only 11 percent require this much training of their graduate students).

Estimates of average hours of training usually taken by graduate students and undergraduates also are very different: 57 percent estimated that graduate students average 0 hours of training, compared with 22 percent who estimated that the average undergraduate does not take any training.

Exhibit VII-23

HOURS[a] OF TRAINING IN INSTRUCTIONAL USES OF AUDIO, VIDEO, AND MULTIMEDIA TECHNOLOGIES REQUIRED AND USUALLY TAKEN BY TEACHER EDUCATION STUDENTS

	Hours Required		Hours Usually Taken	
	Undergraduate Majors	Graduate Students	Undergraduate Majors	Graduate Students
None	29*	71	22	57
1 to 20	48	16	56	29
21 to 50	17	10	14	8
51 to 80	2	1	4	2
More than 80	1	<1	1	<1
Have no idea	2	1	3	3

---

*I.e., 29% of 4-year institutions do not require undergraduate teacher education majors to take any training in instructional uses of audio, video, or multimedia technologies.

[a] Defined as "actual hours of training, not credit hours."

Source: Teacher Education questionnaire, questions 16 and 17.

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FACULTY AND STUDENT USE OF AVM TECHNOLOGIES

Education faculty reported considerably more classroom use of AVM instructional materials than did their non-education counterparts in 4-year schools (Exhibit VII-24). Overall, 82 percent of education faculty reported that they used some kind of AVM materials as an instructional tool in one or more of their for-credit courses during the 1993 Fall Term, compared with 66 percent of non-education faculty. Most frequently used were video materials. Two-thirds (67 percent) of education faculty, compared with about half (48 percent) of non-education faculty, reported that during the 1993 Fall Term they used video instructional materials in the classroom. There are no appreciable differences between the two groups in their use of audio or video materials **not** designed specifically for instructional use or in their use of multimedia materials for self-paced individualized instruction.

Exhibit VII-24

PERCENTAGES OF EDUCATION FACULTY AND OTHER 4-YEAR-SCHOOL FACULTY WHO USED AVM TECHNOLOGIES IN AN ON-CAMPUS COURSE DURING THE 1993 FALL TERM

	Education Faculty	Other Faculty	All Faculty in 4-Year Institutions
Used audio instructional materials (audio materials created specifically for instructional use, such as lectures or other classroom presentations, language tapes, etc.)	▲41*	▲27	28
Used other audio (music, entertainment, news broadcasts, documentaries, etc.)	23	24	24
Used video instructional materials (video materials created specifically for instructional use, such as lectures, classroom demonstrations, etc.)	▲67	▲48	49
Used other video (entertainment, documentaries, etc.)	37	36	36
Used multimedia materials (computer-mediated integration of text, audio, and/or video) used in classroom presentations	▲20	▲12	13
Used multimedia materials used for self-paced individualized instruction	8	7	7
Used none of the above	▲18	▲34	33

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*I.e., 41% of teacher education faculty reported that during the 1993 Fall Term they had used audio instructional materials as an instructional tool in one or more for-credit courses.

▲ This percentage is statistically significantly different from the other group of faculty (p < .05).

Source: Faculty questionnaire, question 22.

Similarly, education faculty are more likely than others to have videotaped public television programs (Exhibit VII-25). Forty-percent of education faculty, compared with 24 percent of other 4-year-school faculty, reported that during the past 12 months they had videotaped a public television program for use as an instructional tool in a higher education for-credit course. Two-thirds of education faculty and 41 percent of other faculty have done this at some time in the past. (There are too few education faculty to present differences by type of institution.)

Exhibit VII-25

PERCENTAGES OF EDUCATION FACULTY AND OTHER 4-YEAR-SCHOOL FACULTY WHO HAVE VIDEOTAPED PUBLIC TELEVISION PROGRAMS

	Education Faculty	Other Faculty	All Faculty in 4-Year Institutions
During the past 12 months, videotaped a public television program for use as an instructional tool in a higher education for-credit course	▲40*	▲24	27
At some time in the past, videotaped a public television program for use as an instructional tool in a higher education for-credit course	▲67	▲41	47

---

*I.e., 40% of teacher education faculty reported that during the past 12 months they had videotaped a public television program for use as an instructional tool in a higher education for-credit course.

▲This percentage is statistically significantly different from the other group of faculty (p < .05).

Source: Faculty questionnaire, question 22.

Education faculty also are more likely than their non-education counterparts to have developed AVM instructional materials for use in higher education (Exhibit VII-26). As with classroom use, the materials most likely to have been developed are video materials. Thirty percent of education faculty, compared with 21 percent of other 4-year-school faculty, reported that they had developed video instructional materials in the past 12 months.

Exhibit VII-26

PERCENTAGE OF EDUCATION FACULTY AND OTHER 4-YEAR-SCHOOL FACULTY WHO, IN THE PAST 12 MONTHS, DEVELOPED AVM INSTRUCTIONAL MATERIALS FOR USE IN HIGHER EDUCATION

	Education Faculty	Other Faculty	All Faculty in 4-Year Institutions
Audio instructional materials	▲20	▲11	11
Video instructional materials	▲30	▲21	21
Multimedia instructional materials (computer-mediated integration of text, audio, and/or video materials)	▲14	▲7	7

---

*I.e., 20% of teacher education faculty reported that during the past 12 months they had developed audio instructional materials for use in higher education.

▲This percentage is statistically significantly different from the other group of faculty (p < .05).

Source: Faculty questionnaire, question 25.

Institutional-level estimates of use of AVM technologies by education faculty also show that video technologies are by far the most widely used of the three types (Exhibit VII-27). About half of the schools (52 percent) estimated that more than 50 percent of their faculty had used video technologies in a 1993 Fall Term course, compared with 24 percent who estimated this level of use of audio technologies and 9 percent who estimated this level of use for multimedia technologies. These estimates seem somewhat lower than might be expected, given the faculty self-reports of use of AVM materials.

Exhibit VII-27

ESTIMATED PERCENTAGES OF EDUCATION FACULTY WHO USED EACH LISTED TECHNOLOGY IN AN ON-CAMPUS COURSE DURING THE 1993 FALL TERM

(4-Year Institutions Only)

	None	Fewer than 10%	10% to 25%	26% to 50%	More than 50%	Have No Idea
Audio technologies	4*	17	23	24	24	9
Video technologies	2	8	13	23	52	2
Multimedia technologies	14	37	21	12	9	6

*I.e., 4% of respondents estimated that none of their education faculty had used audio technologies in any of their on-campus courses during the 1993 Fall Term.

Source: Teacher Education questionnaire, question 18.

In spite of the high reported use by education faculty, education students' reports of classroom use of AVM materials were not appreciably different from those of other 4-year-school students. (Student use of AVM materials is discussed in Chapter V.)

TECHNOLOGY-RELATED ACCOMPLISHMENTS

Teacher Education questionnaire respondents were asked about their perceptions of various accomplishments by their School or Department of Education related to computers and AVM technologies. Both overall and among the various types of institutions, respondents tended to give only lukewarm ratings of their school's accomplishments (Exhibit VII-28). Based on a 4-point scale, where 1 = not at all, 2 = not very well, 3 = moderately well, and 4 = very well, the mean ratings for seven of the nine items were 2.4 to 2.6 (i.e., about halfway between "not very well" and "moderately well"). These seven items covered the following issues:

- How well the school/department has done in developing clear plans for the use of instructional technologies and using technologies to improve education in general.
- Meeting faculty, undergraduate, and graduate student needs regarding instructional technology support.
- Enabling undergraduate and graduate students to use technologies effectively as classroom teachers.

The remaining two issues received even lower ratings. "Used communications technologies (such as e-mail, networking, etc.) to increase the frequency, convenience, and/or quality of **student-faculty** interactions" received a mean rating of 2.1, and "provided incentives and rewards for faculty to integrate instructional technologies into the classroom" received a mean of 1.8 (only 16 percent of respondents gave a rating of 3 or 4).

Exhibit VII-28

PERCEIVED INSTITUTIONAL ACCOMPLISHMENTS REGARDING INSTRUCTIONAL TECHNOLOGIES IN TEACHER EDUCATION

(Listed in Descending Order of Mean Ratings)

	Mean Rating	Not at All	Not Very Well	Moderately Well	Very Well	Have No Idea
Developed clear plans for the use of instructional technology in its teacher education program	2.6	9*	33	45	13	0
Met faculty needs regarding equipment, technical support, and training for the use of instructional technologies	2.6	6	41	41	12	0
Met the needs of **undergraduate** teacher education majors regarding equipment, technical support, and training for the use of instructional technologies	2.6	5	38	46	10	1
Enabled your **undergraduate** teacher education majors to use instructional technologies effectively as classroom teachers	2.6	5	40	45	10	1
Used instructional technologies to improve the overall quality of education at your School/Department of Education	2.5	6	43	42	8	1
Met the needs of teacher education **graduate students** regarding equipment, technical support, and training for the use of instructional technologies	2.4	10	42	34	9	5
Enabled your teacher education **graduate students** to use instructional technologies effectively as classroom teachers	2.4	10	41	36	6	6
Used communications technologies (such as e-mail, networking, etc.) to increase the frequency, convenience, and/or quality of **student-faculty** interactions	2.1	31	38	21	10	<1
Provided incentives and rewards for faculty to integrate instructional technologies into the classroom	1.8	36	46	14	2	1

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very well, 3 = moderately well, and 4 = very well.

*I.e:, 9% of respondents reported that, in their opinion, their School/Department of Education had not at all developed clear plans for the use of instructional technology in its teacher education program.

Source: Teacher Education questionnaire, question 22.

The only statistically significant differences by institutional type are on the following four items:

- Development of clear technology plans. The mean ratings range from a low of 2.5 at public doctoral schools to a high of 2.8 at public comprehensive schools.
- Met faculty technology needs. Means range from 2.5 at liberal arts schools to 2.8 at private doctoral schools.
- Improved overall quality of education. Means range from 2.4 at the doctoral schools to 2.6 at private comprehensive and liberal arts schools.
- Used technologies to affect student-faculty interactions. Means range from 1.9 at liberal arts schools to 2.4 at the doctoral schools.

BARRIERS TO INCREASED USE OF COMPUTERS AND AVM INSTRUCTIONAL TECHNOLOGIES

In general, ratings by Teacher Education questionnaire respondents regarding barriers to increased use of instructional technologies parallel those provided by other sets of institutional respondents (see Chapters III and V). As with the other sets of respondents, Teacher Education respondents perceive insufficient funds to be by far the most important barrier to increased use of instructional technologies in teacher education at their institution. Using a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment, respondents gave "insufficient funds" a 3.4 mean rating, with 60 percent of the respondents rating it "a major impediment" (Exhibit VII-29). The next most important impediment is another issue that tends to be money related, lack of appropriate equipment (mean rating = 2.9). Other noteworthy findings are:

- Inadequate faculty technical skills also are relatively important (mean = 2.8)—much more so than inadequate student technical skills (mean = 2.3)—but lack of faculty interest in using technologies is not a very important impediment (mean = 2.2).
- Lack of incentives or rewards to faculty for using instructional technologies is quite important (mean = 2.7), but as found among the other respondent sets, lack of top administrators' interest in technologies is not (mean = 1.9).
- Least important as a barrier are copyright issues (mean = 1.8), but a relatively large percentage of respondents (14 percent) had no idea how to rate this issue.

Exhibit VII-29

PERCEIVED IMPEDIMENTS TO THE INCREASED USE OF INSTRUCTIONAL TECHNOLOGIES IN TEACHER EDUCATION

(Listed in Descending Order of Mean Ratings)

	Mean Rating	Not an Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
Insufficient funds	3.4	3*	13	24	60	1
Lack of appropriate equipment	2.9	12	22	29	36	1
Inadequate faculty technical skills	2.8	7	30	36	27	<1
Lack of incentives/rewards to faculty for using instructional technologies	2.7	13	30	26	27	4
Lack of appropriate instructional software	2.6	18	30	29	22	1
Lack of staff who can provide training in instructional technologies	2.6	22	23	25	29	<1
Lack of strategic planning	2.5	23	29	22	24	2
Lack of infrastructure (e.g., cabling, power outlets, etc.)	2.5	24	30	23	23	1
Lack of appropriate organizational structures	2.4	26	28	22	19	6
Faculty technophobia	2.4	20	36	29	14	2
Inadequate student technical skills	2.3	14	45	29	9	2
Lack of faculty interest in expanded use of instructional technologies	2.2	27	33	28	11	1
Lack of top administrators' interest in expanded use of instructional technologies	1.9	53	17	16	13	1
Student technophobia	1.9	33	44	18	3	2
Copyright issues	1.8	42	25	13	6	14

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

*I.e., 3% of respondents indicated that, in their opinion, insufficient funds is not an impediment to the increased use of instructional technologies in teacher education at their institution.

Source: Teacher Education questionnaire, question 21.

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There are statistically significant differences by institutional type on 9 of the 15 potential barriers listed but no consistency in terms of which types of institutions have relatively high and relatively low ratings (Exhibit VII-30). The largest differences are on lack of faculty incentives (with means ranging from a low of 2.4 at private comprehensive schools to a high of 3.1 at public doctoral schools), lack of infrastructure (means from 1.9 at private doctoral schools to 2.6 at liberal arts schools), lack of staff who can provide training in instructional technologies (means from 2.3 at private doctoral schools to 3.0 at public doctoral schools), and inadequate student technical skills (means from 1.9 at private doctoral schools to 2.5 at public doctoral schools).

Exhibit VII-30

PERCEIVED IMPEDIMENTS TO THE INCREASED USE OF INSTRUCTIONAL TECHNOLOGIES IN TEACHER EDUCATION, BY TYPE OF INSTITUTION

(Listed In Descending Order of Mean Ratings for All 4-Year Institutions)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	All 4-Year Institutions
Insufficient funds	3.4	3.3	3.4	3.4	3.4	3.4
Lack of appropriate equipment	2.8	2.7	2.8	2.9	3.0	2.9
Inadequate faculty technical skills	▲3.1	2.7	2.9	2.7	2.8	2.8
Lack of incentives/rewards to faculty for using instructional technologies	▲3.1	▲2.9	2.8	▲2.4	2.6	2.7
Lack of appropriate instructional software	2.6	2.4	▲2.3	2.4	▲2.8	2.6
Lack of staff who can provide training in instructional technologies	▲3.0	▲2.3	2.6	2.6	2.6	2.6
Lack of strategic planning	2.6	2.6	2.4	2.3	2.6	2.5
Lack of infrastructure (e.g., cabling, power outlets, etc.)	2.3	▲1.9	2.5	2.4	2.6	2.5
Lack of appropriate organizational structures	2.5	2.4	2.3	2.3	2.4	2.4
Faculty technophobia	2.5	2.2	▲2.5	▲2.2	2.3	2.4
Inadequate student technical skills	2.5	▲1.9	2.4	2.2	2.4	2.3
Lack of faculty interest in expanded use of instructional technologies	▲2.6	2.4	2.3	2.1	2.1	2.2
Lack of top administrators' interest in expanded use of instructional technologies	1.8	1.8	1.9	1.9	1.9	1.9
Student technophobia	2.0	1.9	1.9	▲1.8	2.0	1.9
Copyright issues	1.8	1.9	1.7	1.9	1.8	1.8

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

▲This mean is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Teacher Education questionnaire, question 21.

EXPECTATIONS FOR THE FUTURE

Virtually all Teacher Education questionnaire respondents (91 percent) think that, over the next 3 years, there will be an increase in the use of computers and AVM technologies by faculty in teacher education courses (Exhibit VII-31). Large majorities also think that there will be an increase in the amount of technology training provided to undergraduate majors (83 percent) and graduate students (79 percent). Fewer than 1 percent of respondents to any of these items indicated that there is likely to be a decrease in technology training or use.

Public comprehensive schools are more likely than others to think that there will be an increase in faculty technology use and graduate student technology training, whereas private doctoral schools are less likely than others to think that there will be an increase in faculty use and that undergraduate technology training will increase.

Exhibit VII-31

PERCENTAGE OF INSTITUTIONS THAT EXPECT THAT INSTRUCTIONAL TECHNOLOGY USE/TRAINING WILL INCREASE OVER THE NEXT 3 YEARS, BY TYPE OF INSTITUTION

(4-Year Institutions with Undergraduate/Graduate Programs, as Relevant)

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	All 4-Year Institutions
Use of computers and AVM technologies by faculty in teacher education courses	90*	▲83	▲95	92	89	91
Amount of training provided to undergraduate teacher education majors in instructional uses of computers and AVM technologies	85	▲67	87	85	82	83
Amount of training provided to teacher education graduate students in instructional uses of computers and AVM technologies	86	73	▲87	77	73	79

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*I.e., 90% of respondents in public doctoral schools indicated that they believe the use of computers and AVM technologies by faculty in teacher education courses is likely to increase over the next 3 years.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Teacher Education questionnaire, question 19.

The percentages of respondents who expect that technology-related expenditures will increase over the next 3 years are lower than those of respondents who expect that use and training will increase. Most likely to increase are expenditures for multimedia equipment and for computers for instructional purposes, expected to increase by 75 and 76 percent of respondents (Exhibit VII-32). About 6 in 10 respondents (59 percent) expect that expenditures for instructional-technologies technical support will increase, and about half (54 percent) expect that video equipment expenditures will increase. Only a third (32 percent) expect that audio equipment expenditures will increase, and 10 percent think that these expenditures will decrease.

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Exhibit VII-32

EXPECTATIONS REGARDING EXPENDITURES FOR INSTRUCTIONAL TECHNOLOGIES IN SCHOOLS/DEPARTMENTS OF EDUCATION OVER THE NEXT 3 YEARS

(4-Year Institutions Only)

	Increase	Stay the Same	Decrease	Have No Idea
Purchase or upgrading of **audio** equipment	32*	51	10	7
Purchase or upgrading of **video** equipment	54	39	3	4
Purchase or upgrading of **multimedia** equipment	75	18	2	4
Purchase or upgrading of **computers for instructional purposes**	76	19	2	3
Instructional-technologies technical support	59	33	1	7

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*I.e., 32% of respondents indicated that they believe that expenditures for purchases or upgrading of audio equipment are likely to increase over the next 3 years.

Source: Teacher Education questionnaire, question 20.

Private doctoral school respondents generally are the least likely to expect expenditure increases (Exhibit VII-33). Increases in audio expenditures are expected by only 9 and 15 percent of private and public doctoral respondents, respectively, whereas they are expected by 33 to 39 percent of respondents in other types of schools. In other areas of expenditures, except technical support, the percentages of private doctoral school respondents who expect increases are 14 to 21 percentage points below the overall average.

Exhibit VII-33

PERCENTAGE OF INSTITUTIONS THAT EXPECT EXPENDITURES TO INCREASE OVER THE NEXT 3 YEARS, BY TYPE OF INSTITUTION

	Public Doctoral	Private Doctoral	Public Comp.	Private Comp.	Liberal Arts	All 4-Year Institutions
Purchase or upgrading of **audio** equipment	▲15*	▲9	39	33	35	32
Purchase or upgrading of **video** equipment	50	▲33	60	55	52	54
Purchase or upgrading of **multimedia** equipment	77	▲61	▲83	74	72	75
Purchase or upgrading of **computers for instructional purposes**	81	▲61	79	80	72	76
Instructional-technologies technical support	53	54	64	▲67	53	59

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*I.e., 15% of respondents in public doctoral institutions think that the expenditures of their School/ Department of Education for the purchase or upgrading of audio equipment are likely to increase over the next 3 years.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Teacher Education questionnaire, question 20.

VIII. USE OF INSTRUCTIONAL TECHNOLOGIES IN DISTANCE EDUCATION

INTRODUCTION

This chapter covers various aspects of for-credit distance education courses provided by higher education institutions, with a focus on uses of computers and audio, video, and multimedia (AVM) technologies in these courses. Most of the questions covered in this chapter were asked in the Distance Education questionnaire; a few were asked in the Chief Academic Officer (CAO) questionnaire. In addition, results of faculty and student self-reports of having taught or taken a distance education course are reported here. See Chapter II for a description of the institutional, faculty, and student samples and respondents and definitions of the various types of institutions discussed below.

"Distance education" was defined as "the delivery of instruction to students, most of whom are located at a remote off-campus site or sites (including their homes), physically removed from the instructor. Includes: Both one-way and two-way delivery of instruction by print (e.g., correspondence courses), audio, video, and/or computer technologies. Does **not** include: Courses in which the only distance education component is an accommodation for students with disabilities or courses in which the instructor travels to a satellite campus or off-campus location to deliver the instruction in person."

Unless otherwise specified, the Distance Education questionnaire asked about for-credit distance education courses offered by the institution during the 1993 Fall Term.

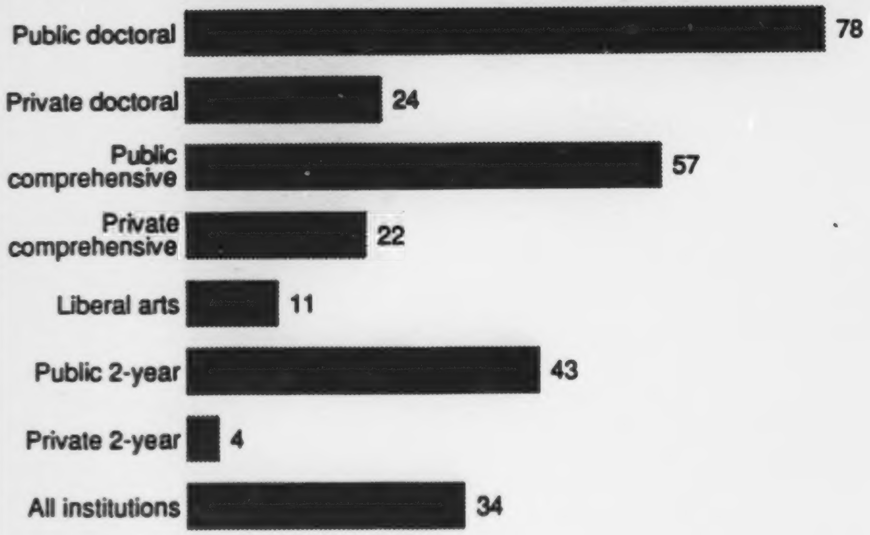
OVERALL SCOPE OF DISTANCE EDUCATION

In total, 343 of the 1,000 institutions surveyed (34 percent) were identified as offering for-credit distance education courses during the 1993 Fall Term. These courses are taught primarily by public institutions. About 8 in 10 schools (78 percent) that offer distance education courses are public institutions. As shown in Exhibit VIII-1, the percentage of schools that offer distance education ranges from 4 percent of private 2-year schools to 78 percent of public doctoral schools. Because of the small sample sizes for private institutions, analyses by type of institution reported in this chapter were conducted using four categories of schools: public doctoral, public comprehensive, public 2-year, and all private institutions.

Although a sizable percentage of schools offer distance education programs, the percentage of faculty who teach these courses and overall student enrollment in distance education are still very low. Seven percent of the faculty (8 percent of those in public schools and 4 percent of those in private schools) reported that they taught one or more for-credit higher education distance education courses during the 1993 Fall Term. There are no statistically significant differences among faculty in the various program areas who reported teaching a distance education course, except that those in humanities are less likely than others (3 percent vs. 7 percent) to have done so.

Exhibit VIII-1

PERCENTAGE OF INSTITUTIONS THAT OFFERED FOR-CREDIT DISTANCE EDUCATION COURSES DURING THE 1993 FALL TERM, BY TYPE OF INSTITUTION



Source: Distance Education questionnaire, question 1.

Among students, only 3.5 percent of those surveyed reported that they were enrolled in a for-credit distance education course during the past term. The *Digest of Education Statistics, 1994*,[1] reports that a total of 14,491,226 students were enrolled in institutions of higher education in 1992 (the most recent year for which statistics are available). Extrapolating from these two statistics, it appears that approximately 510,000 students were enrolled in higher education for-credit distance education courses in the winter/spring of 1994. Estimates of distance education enrollment derived from enrollment estimates provided by the Distance Education questionnaire respondents are about 30 percent higher (approximately 670,000). A number of Distance Education respondents indicated that estimating enrollment was very difficult, so it is likely that inaccuracies in these estimates are a major cause of the discrepancy between the two sets of numbers. Also, the 670,000 estimate is derived from separate estimates by respondents of (1) enrollment in print-based correspondence courses and (2) enrollment in technology-based distance education courses. These two estimates were treated as non-overlapping,[2] but it is possible that there is actually some overlap in them (e.g., enrollment in correspondence courses that include videotapes or audiotapes might have been included in both estimates).

PRINT-BASED CORRESPONDENCE COURSES

Print-based correspondence courses, once the predominant distance education method, are now relatively rare. Only 7 percent of institutions currently offer for-credit print-based correspondence courses.[3] As shown in Exhibit VIII-2, these kinds of courses are considerably more likely to be offered by public doctoral schools (35 percent offer them) than by other types of schools. Almost no private schools (2 percent) or public 2-year schools (5 percent) offer them.

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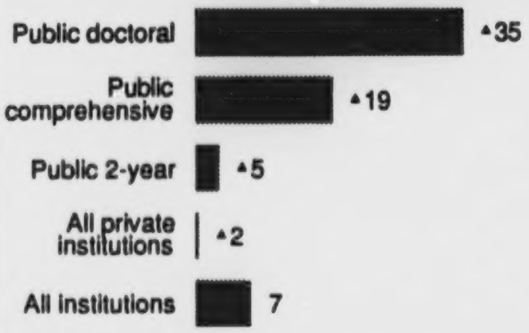
[1] U.S. Department of Education, Office of Educational Research and Improvement. NCES 94-115, page 174.

[2] Respondents were instructed not to include print-based correspondence courses in their responses to questions about technology-based courses.

Exhibit VIII-2

PERCENTAGE OF INSTITUTIONS THAT OFFER FOR-CREDIT PRINT-BASED CORRESPONDENCE COURSES, BY TYPE OF INSTITUTION



▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Distance Education questionnaire, question 4.

The average (mean) number of correspondence courses offered (among schools that offer them) is 49, with a range from 1 course to 350 courses. The average number of correspondence students at these schools is 1,457 (ranging from 1 student to 22,000 students). There are too few respondents to report differences by institutional type in these responses.

Only about half (45 percent) of the institutions that currently offer print-based correspondence courses expect that over the next 3 years they are likely to increase the number of these courses that they offer. Forty-one percent expect the number of these courses to stay the same, and 7 percent expect a decrease. Eight percent reported that they have no idea about how the numbers of these courses will change. (Again, there are too few respondents to report differences by institutional type.)

TECHNOLOGY-BASED DISTANCE EDUCATION COURSES

Across all types of institutions, 25 percent of institutions offered for-credit "technology-based" distance education courses[4] during the 1993 Fall Term, but there are enormous differences by type of institution, ranging from 69 percent of public doctoral schools down to only 7 percent of private schools (Exhibit VIII-3). Considerably more schools offered these courses at the undergraduate level than at the graduate level (23 percent vs. 9 percent), largely reflecting the institutions' regular course offerings. For example, the public doctoral schools are the only type equally likely to offer undergraduate and graduate courses (offered by 54 and 57 percent of the public doctorals, respectively).

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[3] Print-based correspondence courses were not related to the 1993 Fall Term (as most of the other questions were) because many are ongoing with no specific schedule.

[4] I.e., those in which the delivery of instruction is done by audio, video, and/or computer technologies.

Exhibit VIII-3

PERCENTAGE OF INSTITUTIONS THAT OFFERED FOR-CREDIT TECHNOLOGY-BASED DISTANCE EDUCATION COURSES DURING THE 1993 FALL TERM, BY TYPE OF INSTITUTION

	Public Doctoral	Public Comp.	Public 2-Year	All Private Institutions	All Institutions
Any for-credit courses	▲69*	▲41	▲35	▲7	25
Undergraduate courses[a]	▲54	▲37	▲34	▲5	23
Graduate-level courses[a]	▲57	▲22	▲3	▲3	9

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*I.e., 69% of public doctoral institutions offered for-credit technology-based distance education courses during the 1993 Fall Term.

[a] Respondents were instructed not to count the same course in both graduate and undergraduate categories. If a course could be taken for either undergraduate or graduate credit, it was to be counted as an undergraduate course.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Distance education questionnaire, questions 7 and 11.

Although far more schools offer technology-based distance education courses than correspondence courses, the average number of courses offered and average enrollment are much smaller. The average number of technology courses offered during the 1993 Fall Term was 14 (ranging from 1 to 197 courses). The average number of students per school was 304 (ranging from 9 to 8,000 students). As shown in Exhibit VIII-4, public doctoral institutions tended to offer the most courses (mean = 26), whereas public comprehensive institutions tended to offer the fewest (mean = 10). However, there are no statistically significant differences among types of institutions in estimated enrollment.

Exhibit VIII-4

FOR-CREDIT TECHNOLOGY-BASED DISTANCE EDUCATION COURSES OFFERED DURING THE 1993 FALL TERM: MEAN NUMBER OF COURSES AND MEAN ENROLLMENT, BY TYPE OF INSTITUTION

(Institutions That Offer Technology-Based Distance Education)

	Public Doctoral	Public Comp.	Public 2-Year	All Private Institutions	All Institutions
Mean number of courses	▲26	▲10	12	18	14
Mean estimated enrollment	433	224	278	391	304

▲This mean is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Distance Education questionnaire, question 9.

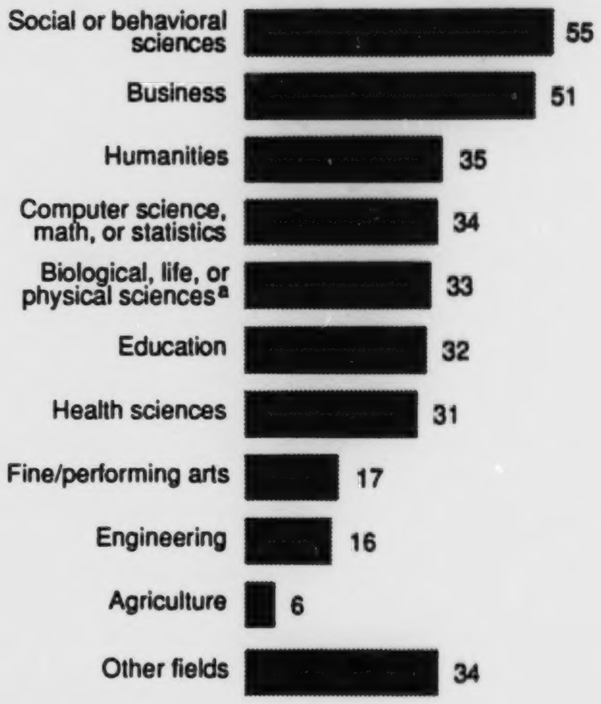
Among schools that offer technology-based distance education courses for undergraduates, the mean number of undergraduate courses offered during the 1993 Fall Term was 12 (the maximum was 190), and among those that offer graduate-level courses, the mean number of these courses was 6 (the maximum was 155). (There were too few respondents to these items to report differences by institutional type.)

As shown in Exhibit VIII-5, technology-based distance education courses were most likely to be offered in social/behavioral sciences or business. Among institutions that offered any technology-based distance education courses, 55 and 51 percent, respectively, offered courses in these fields. About 3 in 10 schools offered courses in the following fields: humanities; biological, life, or physical sciences; computer science, math, or statistics; education; and health sciences.

Exhibit VIII-5

PERCENTAGE OF INSTITUTIONS THAT OFFERED 1993 FALL TERM FOR-CREDIT TECHNOLOGY-BASED DISTANCE EDUCATION COURSES IN VARIOUS FIELDS OF STUDY

(Institutions That Offer Technology-Based Distance Education)



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[a] Other than health sciences.

Source: Distance Education questionnaire, question 14.

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Types of Technologies Used in Distance Education

There is considerable variability in the types of technologies used in distance education courses, with no one technology being used by more than about a third of distance education institutions. (Respondents were instructed that courses that involve more than one technology should be counted under *each* applicable technology. For example, a course involving two-way audio and one-way live video was to be counted in *both* categories.[5]) As Exhibit VIII-6 shows, technologies used the most often are two-way interactive video and one-way "high-level production" pre-recorded video (used by 41 and 40 percent of distance education institutions, respectively). The next most commonly used technologies are one-way "low-level production" pre-recorded video (36 percent), two-way audio (33 percent), and one-way live video (28 percent). Each of the other technologies is used at fewer than 20 percent of distance education institutions.

In keeping with the relatively high number of distance education courses that public doctoral institutions offer and with their overall diversity as institutions, public doctoral institutions are more likely than others to use most of the technologies listed and are more likely to use a variety of technologies. The differences between public doctorals and other types of institutions are especially large with regard to two-way audio communication (used at 58 percent of the public doctorals vs. 22 to 43 percent of other types of schools) and one-way live video (50 percent vs. 19 to 34 percent, respectively). In contrast, public 2-year schools are less likely than others to use several of the technologies, including the two-way interactive technologies (video, audio, and online) and one-way live video; instead, these schools tend to rely largely on one-way pre-recorded video technologies (48 percent use high-level production video, and 37 percent use low-level production video). Public 2-year schools also are the least likely to use four or more different technologies.

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[5] We considered asking respondents to report what combinations of technologies were used but found that this became too cumbersome and confusing for respondents.

Exhibit VIII-6

PERCENTAGE OF INSTITUTIONS THAT USED VARIOUS TECHNOLOGIES IN 1993 FALL TERM DISTANCE EDUCATION COURSES, BY TYPE OF INSTITUTION

(Institutions That Offer Technology-Based Distance Education)

(Listed in Descending Order of "All Institutions" Percentages)

	Public Doctoral	Public Comp.	Public 2-Year	All Private Institutions	All Institutions
Two-way interactive video	▲55*	▲55	▲33	39	41
One-way **pre-recorded** video involving a significant investment in production (e.g., involving narrated documentary, simulations, graphics, etc.), produced either at your institution or elsewhere	32	34	▲48	33	40
One-way **pre-recorded** video with relatively little production effort (e.g., videotaped recording of a lecture course)	▲52	30	37	30	36
Two-way audio communication among instructor and students during the delivery of instruction	▲58	▲43	▲22	31	33
One-way **live** video	▲50	34	▲19	32	28
Two-way online (computer-based) communication among instructor and students during the delivery of instruction	▲27	21	▲9	26	16
One-way audio (radio broadcast, audiotapes, etc.)	10	8	15	10	12
Self-paced computer-based instruction	13	15	9	8	11
Other audio, video, or computer-based technologies	17	13	16	▲4	14
Any of the two-way technologies	▲85	▲81	▲49	71	64
Any one of the above technologies	▲10	30	40	47	35
Any two of the above technologies	30	23	30	▲16	26
Any three of the above technologies	27	25	16	19	20
Four or more of the above technologies	▲33	23	▲12	18	18

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*I.e., 55% of public doctoral institutions that offered technology-based distance education courses used two-way interactive video in one or more 1993 Fall Term distance education courses.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Distance Education questionnaire, question 8.

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Among the institutions that used each kind of technology, the mean (average) number of each of these kinds of courses ranges from 3 (for one-way audio and self-paced computer-based instruction) to 10 (for one-way low-production pre-recorded video and two-way audio) (Exhibit VIII-7). Excluding the "other technologies" group, the maximum number of each type of course offered by any one institution ranges from 20 (for self-paced computer-based instruction) to 125 (for one-way low-production pre-recorded video and two-way audio).

Exhibit VIII-7

MEAN AND MAXIMUM NUMBER OF COURSES THAT USED VARIOUS TECHNOLOGIES IN 1993 FALL TERM DISTANCE EDUCATION COURSES

(Institutions That Used Each Kind of Technology)

	Mean Number of Courses	Maximum Number of Courses
Two-way interactive video	7	52
One-way pre-recorded video involving a significant investment in production (e.g., involving narrated documentary, simulations, graphics, etc.), produced either at your institution or elsewhere	9	75
One-way pre-recorded video with relatively little production effort (e.g., videotaped recording of a lecture course)	10	125
Two-way audio communication among instructor and students during the delivery of instruction	10	125
One-way live video	6	50
Two-way online (computer-based) communication among instructor and students during the delivery of instruction	4	50
One-way audio (radio broadcast, audiotapes, etc.)	3	21
Self-paced computer-based instruction	3	20
Other audio, video, or computer-based technologies	9	156

Source: Distance Education questionnaire, question 8.

Faculty-Student Interactivity in Distance Education Courses

As shown in Exhibit VIII-8, distance education courses that use two-way interactive methods for faculty-student communication during the delivery of instruction are considerably more common for both undergraduates and graduate students than courses that provide no faculty-student interaction at all. For undergraduates, 51 percent of schools offered the former during the 1993 Fall Term, whereas only 27 percent offered the latter; for graduate students, the comparable figures were 28 and 5 percent. Public 2-year schools are the only types that are about as likely to provide courses with no interaction as courses with two-way interaction. During the 1993 Fall Term, about half of the institutions (55 percent) had teaching assistants or facilitators for at least some of their distance education courses who were regularly present at the site where most students received instruction. This was most common among public doctoral and public comprehensive institutions (70 and 68 percent of these institutions, respectively, had on-site facilitators).

Exhibit VIII-8

INTERACTIVITY IN TECHNOLOGY-BASED DISTANCE EDUCATION COURSES IN THE 1993 FALL TERM, BY TYPE OF INSTITUTION

(Institutions That Offer Technology-Based Distance Education)

	Public Doctoral	Public Comp.	Public 2-Year	All Private Institutions	All Institutions
Undergraduate courses that used a two-way interactive method	▲62*	▲75	▲38	52	51
Graduate-level courses that used a two-way interactive method	▲64	▲45	▲7	42	28
Undergraduate courses with no student-instructor interaction	21	26	▲36	▲6	27
Graduate-level courses with no student-instructor interaction	▲16	7	▲1	8	6
Technology-based distance education courses in which a teaching assistant/facilitator was regularly present at the sites where most students received instruction	▲70	▲68	▲47	47	55

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*I.e., 62% of public doctoral institutions that offer technology-based distance education courses offered undergraduate courses during the 1993 Fall Term that used a two-way interactive method.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Distance Education questionnaire, questions 10, 12, and 13.

Among the various fields of study, engineering and, especially, education are the most likely to offer distance education courses with two-way interaction between faculty and students (Exhibit VIII-9). Among schools that offered technology-based distance education courses in these fields during the 1993 Fall Term, 75 percent of those in engineering and 83 percent of those in education had at least some courses with two-way interactions. Education also is the least likely to offer courses with no student-instructor interaction (only 13 percent did so). Other fields that are relatively likely to provide for two-way interactions are health sciences (56 percent), computer science, math, or statistics (51 percent), and humanities (50 percent). In most of the fields, about 20 to 30 percent of the schools that offer those courses have some courses with no student-instructor interaction.

Exhibit VIII-9

INTERACTIVITY IN TECHNOLOGY-BASED DISTANCE EDUCATION COURSES, BY FIELD OF STUDY

(Institutions That Offered Courses in Each Field)

(Listed in Descending Order of Percentage That Used a Two-Way Interactive Method)

	Percentage with Courses That Used a Two-Way Interactive Method	Percentage with Courses That Involved NO Student-Instructor Interaction
Education	83*	13
Engineering	75	27
Health sciences	56	24
Computer science, math, or statistics	51	26
Humanities	50	30
Business	45	23
Social or behavioral sciences	37	27
Biological, life, or physical sciences[a]	37	19
Fine/performing arts	35	35
Agriculture	28	26
Other fields	55	24

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*I.e., 83% of institutions that offered for-credit technology-based distance education courses in education during the 1993 Fall Term offered courses that used a two-way interactive method.

[a] Other than health sciences.

Source: Distance Education questionnaire, question 14.

Origins and Destinations of Technology-Based Distance Education Courses

Courses Originated Elsewhere

During the 1993 Fall Term, two-thirds (66 percent) of the schools that offer technology-based distance education courses offered at least some for-credit courses that originated or were produced at another higher education institution or at a commercial or noncommercial organization (e.g., NTU, Annenberg/CPB, etc.). A third (34 percent) reported that 75 percent or more of their courses originated elsewhere. About twice as many public 2-year schools as others offered some of these kinds of courses (87 percent vs. 40 to 48 percent) (Exhibit VIII-10). Correspondingly, public 2-year schools were more likely than others to report that none of their own faculty teach technology-based distance education courses (14 percent vs. 4 to 6 percent).

Exhibit VIII-10

ISSUES RELATED TO ORIGINS AND DESTINATIONS OF FOR-CREDIT TECHNOLOGY-BASED DISTANCE EDUCATION COURSES DURING THE 1993 FALL TERM, BY TYPE OF INSTITUTION

(Institutions That Offer Technology-Based Distance Education)

	Public Doctoral	Public Comp.	Public 2-Year	All Private Institutions	All Institutions
Offered courses that **originated or were produced at another institution** of higher education or at a commercial or noncommercial organization (e.g., NTU, Annenberg/CPB, etc.)	▲40*	▲48	▲87	▲45	66
None of the institution's own faculty teach technology-based distance education courses	5	4	▲14	6	9
At least some of the courses that were produced by the institution (e.g., taught by its faculty) were **also offered for credit by other institutions**	▲41	24	34	25	31
For at least some courses offered, the institution had **formal arrangements with one or more employers** to provide distance education in their workplace	▲63	31	▲22	27	30
Offered courses in which it was possible for students to receive instruction **in their homes**	62	▲47	▲82	▲54	71
Offered courses in which students were required to go to a location **outside their home or workplace** to receive instruction	▲89	▲96	▲72	64	78

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*I.e., 40% of public doctoral institutions that offered technology-based distance education courses offered courses during the 1993 Fall Term that originated or were produced at another institution.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Distance Education questionnaire, questions 24 - 28 and 31.

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Courses Used by Other Institutions

About a third (31 percent) of the schools that offer technology-based distance education courses reported that one or more of the courses they produced (e.g., courses taught by their faculty) during the 1993 Fall Term also were offered for credit by other institutions. Public doctoral schools were more likely than the other types of schools to have other institutions use their courses (41 percent vs. 24 to 34 percent).

Courses in the Workplace

Thirty percent of the schools that offer technology-based distance education courses had formal arrangements with one or more employers to provide one or more distance education course in their workplace. Public doctoral institutions were at least twice as likely as others to do so: 63 percent of the public doctorals had these arrangements, compared with 22 to 31 percent of the other types of schools.

Courses in the Home

Most distance education schools have at least some technology-based distance education courses in which students can receive instruction at home, as well as some that require students to go to a location outside their home or workplace. Among the schools that offer technology-based distance education courses, 71 percent offered at least some in which it was possible for students to receive instruction in their homes, and at 45 percent of the schools, 75 percent or more of courses offered allowed for receipt of instruction in the home. Conversely, 78 percent of the schools offered technology-based distance education courses that required students to go to a location outside their home or workplace, and at 39 percent of the schools, 75 percent or more of these courses required students to go to an outside location.

Public 2-year schools were more likely than others to provide in-home instruction (82 percent offered at least some of these kinds of courses) and less likely than others to require students to go to an outside location (72 percent did so). In contrast, public comprehensive and private schools were less likely than others to provide in-home instruction (47 and 54 percent, respectively), and public comprehensives were more likely than others to require students to go to an outside location (96 percent did so).

Distance of Students from Campus

As shown in Exhibit VIII-11, about 6 in 10 distance education schools (58 percent) estimated that 75 percent or more of their technology-based distance education students are located in the same state as their school. About a third (35 percent) estimated that 75 percent or more live within 25 miles of campus, and 23 percent estimated that 75 percent or more live more than 25 miles from campus but within the state. Relatively few distance education students live outside the United States (81 percent of the schools reported that none of their students do so) or even in a different state from their school (58 percent said none live in other states).

Exhibit VIII-11

ESTIMATED DISTANCE OF DISTANCE EDUCATION STUDENTS FROM CAMPUS

(Institutions That Offer Technology-Based Distance Education)

	None	Fewer than 25%	25% to 49%	50% to 74%	75% or More	Have No Idea
Within 25 miles of campus	8*	19	11	19	35	8
More than 25 miles from campus but within the state	8	29	19	14	23	8
In other state(s)	58	29	3	3	2	5
Outside the United States	81	14	0	0	1	4

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*I.e., 8% of Distance Education respondents in schools that offer technology-based distance education reported that none of their technology-based distance education students are located within 25 miles of campus.

Source: Distance Education questionnaire, question 30.

The types of schools are quite different in terms of how far their distance education students live from campus (Exhibit VIII-12). Most public 2-year schools (69 percent) estimated that half or more of their distance education students live within 25 miles of campus, whereas most public doctoral and comprehensive schools (61 and 68 percent, respectively) estimated that more than half of their students live more than 25 miles from campus but within the state. Private institutions are the most likely to have out-of-state distance education students (20 percent estimated that more than half their distance education students live in other states).

Exhibit VIII-12

PERCENTAGES OF INSTITUTIONS WITH 50 PERCENT OR MORE OF TECHNOLOGY-BASED DISTANCE EDUCATION STUDENTS LOCATED AT VARIOUS DISTANCES FROM THE CAMPUS, BY TYPE OF INSTITUTION

(Institutions That Offer Technology-Based Distance Education)

	Public Doctoral	Public Comp.	Public 2-Year	All Private Institutions	All Institutions
Within 25 miles of campus	▲25*	43	▲69	47	54
More than 25 miles from campus but within the state	▲61	▲68	▲16	43	37
In other state(s)	10	3	0	▲20	5
Outside the United States	0	0	0	3	1

---

*I.e., 25% of public doctoral Distance Education respondents reported that 50% or more of their distance education students are located within 25 miles of campus.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Distance Education questionnaire, question 30.

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ASSISTANCE/TRAINING PROVIDED TO DISTANCE EDUCATION STUDENTS AND FACULTY

Assistance Provided to Students

A number of different types of assistance typically are provided to students in technology-based distance education courses. The most common of these are easy access to bookstore resources, easy access to library resources/services, and face-to-face access to instructors, counselors, and advisors. Each of these is provided to all distance education students in about half of the institutions that provide technology-based distance education (Exhibit VIII-13). About 4 in 10 schools provide opportunities to receive training in distance education methods, opportunities to interact with other students, and toll-free telephone access to instructors, counselors, and advisors to all distance education students. In contrast, e-mail access to instructors, counselors, and advisors is still relatively uncommon, being provided to all distance education students at only 10 to 13 percent of schools and to none of the students at 50 to 60 percent of schools.

Exhibit VIII-13

ASSISTANCE AVAILABLE TO TECHNOLOGY-BASED DISTANCE EDUCATION STUDENTS

(Institutions That Offer Technology-Based Distance Education)

(Listed in Descending Order of the "All" Percentages)

	None	Some	Most	All
Easy access to bookstore resources (by mail, telephone, or e-mail)	10*	13	19	57
Face-to-face access to instructors	4	22	19	54
Face-to-face access to counselors and/or advisors	9	22	17	50
Easy access to library resources and services (by mail, telephone, or e-mail)	9	18	23	47
Opportunities to receive orientation/training in methods used in distance education courses	28	17	11	40
Opportunities to interact with other students (either in person or at a distance)	8	29	22	40
Toll-free telephone access to instructors	33	10	15	39
Toll-free telephone access to counselors and/or advisors	35	11	14	36
E-mail or other online access to instructors	50	26	8	13
E-mail or other online access to counselors and/or advisors	60	19	7	10

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*I.e., 10% of Distance Education respondents reported that none of their distance education students have easy access to bookstore resources. Row percentages may not sum to 100 because "have no idea" responses (all less than 5%) are not shown.

Source: Distance Education questionnaire, question 32.

Face-to-face access to instructors, counselors, and advisors is much more common at public 2-year schools than at public doctoral or public comprehensive schools (Exhibit VIII-14). For example, 72 percent of public 2-year schools provide face-to-face access to instructors to all their distance education students, compared with only 23 percent of public doctoral schools and 35 percent of public comprehensive schools. Public 2-year schools also are much more likely than others to provide opportunities to receive orientation or training in distance education methods (58 percent vs. 13 to 27 percent). All of these differences probably are due largely to the fact that students at the 2-year schools are much more likely than others to live relatively near campus.

Private schools are considerably more likely than public schools to provide easy access to bookstore and library resources and e-mail access to instructors, counselors, and advisors. For example, 89 percent of private schools provide easy access to bookstore resources, compared with 48 to 54 percent of public schools, and 31 percent of private schools provide e-mail access to instructors, compared with 9 to 13 percent of public schools.

Exhibit VIII-14

PERCENTAGES OF INSTITUTIONS THAT PROVIDE ASSISTANCE TO ALL TECHNOLOGY-BASED DISTANCE EDUCATION STUDENTS, BY TYPE OF INSTITUTION

(Institutions That Offer Technology-Based Distance Education)

	Public Doctoral	Public Comp.	Public 2-Year	All Private Institutions	All Institutions
Easy access to bookstore resources (by mail, telephone, or e-mail)	54*	48	51	▲89	57
Face-to-face access to instructors	▲23	▲35	▲72	42	54
Face-to-face access to counselors and/or advisors	▲20	▲29	▲64	61	50
Easy access to library resources and services (by mail, telephone, or e-mail)	45	46	42	▲68	47
Opportunities to receive orientation/ training in methods used in distance education courses	▲13	▲24	▲58	27	40
Opportunities to interact with other students (either in person or at a distance)	37	37	39	48	40
Toll-free telephone access to instructors	33	▲22	46	48	39
Toll-free telephone access to counselors and/or advisors	▲25	27	41	40	36
E-mail or other online access to instructors	13	10	▲9	▲31	13
E-mail or other online access to counselors and/or advisors	10	10	▲6	▲23	10

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*I.e., 54% of public doctoral respondents reported that all of their students in technology-based distance education courses have easy access to bookstore resources.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Distance Education questionnaire, question 32.

Training Provided to Faculty

About two-thirds of distance education institutions (63 percent) provide training in the use and applications of distance education technologies to faculty who teach technology-based distance education courses. Public comprehensive schools are somewhat more likely than others to provide this training (76 percent do so, vs. 58 percent of public 2-year schools, 60 percent of private schools, and 69 percent of public doctoral schools). Less common is training in the development of curricula for distance education courses, which is provided by 39 percent of schools. There are no appreciable differences by institutional type on this issue.

DISTANCE EDUCATION FACILITIES AND EQUIPMENT

Among institutions that offer various kinds of technology-based distance education courses, between 41 percent and 61 percent use their own facilities (e.g., switches and bridges) to establish links among faculty and students (Exhibit VIII-15). Most of the rest (32 to 46 percent) use a combination of their own facilities and those of an outside supplier; relatively few (3 to 13 percent) use an outside supplier's facilities exclusively. Use of one's own facilities exclusively is most common for courses that involve two-way online communication and least common for two-way video. (Too few schools offer each of these kinds of courses to show differences by institutional type.)

Exhibit VIII-15

PERCENTAGES OF INSTITUTIONS THAT USE THEIR OWN OR AN OUTSIDE SUPPLIER'S FACILITIES FOR VARIOUS KINDS OF DISTANCE EDUCATION COURSES

(Institutions That Offer Each Kind of Course)

	Use Own Facilities	Use an Outside Supplier's Facilities	Combination of Own and Outside Supplier
Two-way video	41*	13	46
Two-way online (computer-based) communication	61	3	35
Two-way audio	50	13	37
Combination of two-way online and two-way audio	50	6	44
One-way video with two-way online communication	56	8	37
One-way video with two-way audio	56	12	32

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*i.e., 41% of institutions that provide two-way video distance education courses use their own facilities to establish links among faculty and students.

Source: Distance Education questionnaire, question 16.

Video Distribution Systems

The most common methods for distributing 1993 Fall Term video courses[6] were cable systems (used by 44 percent of institutions that offered video courses) and public television stations (used by 35 percent of institutions) (Exhibit VIII-16). Other methods used by about a fifth or more of schools were state or regional government delivery systems (28 percent), telephone company lines (27 percent) ITFS (22 percent), and campus closed-circuit systems (19 percent).

Reflecting the relative proximity of their students (or, more appropriately, probably requiring that proximity), public 2-year schools were the most likely to use cable (56 percent) and public television stations (47 percent). Public doctoral and public comprehensive schools, with their geographically more distant students, were more likely than others to use state or regional government delivery systems or (for public comprehensive schools) telephone company lines.

Exhibit VIII-16

PERCENTAGES OF INSTITUTIONS THAT USED VARIOUS DISTRIBUTION METHODS FOR THEIR 1993 FALL TERM FOR-CREDIT VIDEO COURSES, BY TYPE OF INSTITUTION

(Institutions That Offer Video Courses)

	Public Doctoral	Public Comp.	Public 2-Year	All Private Institutions	All Institutions
Cable system	44*	39	▲56	▲16	44
Public television station	27	33	▲47	▲3	35
State or regional government delivery system (satellite or closed-circuit system, fiber-optic network, etc.)	▲43	▲53	▲17	15	28
Telephone company lines	34	▲39	▲14	▲47	27
Instructional television fixed service (ITFS)	▲37	27	17	18	22
Campus closed-circuit system	▲29	24	17	9	19
Satellite delivery system other than DBS or government satellite system (e.g. NTU)	▲34	8	▲5	17	11
Commercial television station	0	2	▲8	0	5
Bookstore(s)	0	0	3	▲17	4
Direct Broadcast Satellite (DBS) operator (DirecTV, etc.)	2	4	3	2	3
Home video distributor (Blockbuster, etc.)	2	0	2	0	1
Other distribution methods	18	▲10	▲29	▲3	19

*I.e., at 44% of public doctoral institutions that offer video courses, a cable system distributed at least some of the for-credit video courses offered by the institution during the 1993 Fall Term.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Distance Education questionnaire, questions 17 and 21.

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[6] Video courses were defined as "any course taught via two-way interactive video or one-way video (including live one-way video, television broadcast, videotape, pre-recorded television courses, etc.)."

BEST COPY AVAILABLE

Distribution of Video Courses through Cable Systems

Among those institutions that distribute video courses through cable systems, about half (53 percent) do some or all of the programming of the cable system themselves. At 36 percent of the institutions, a public television station does some or all of the programming, and at 29 percent, a community-access channel is involved. In most cases (67 percent), at least one channel is programmed **primarily** for instructional purposes. (Forty-four percent program one channel for these purposes, 11 percent program two, and 12 percent program three or more.) On average, 2.4 cable systems carry the institution's instructional channel(s), with an average of 88,326 subscribers. The institution with the largest such delivery system reported that its instructional channels are carried by 10 cable systems, with a total of 400,000 subscribers. (There were too few respondents to these questions to report differences by institutional type.)

Instructional Television Fixed Services (ITFS)

Nineteen percent of the schools that offer video courses reported that their institution holds the license for ITFS. The average number of services for which a license is held is 3.6; the maximum reported is 20. Of those that hold an ITFS license, 41 percent reported that they lease some of their ITFS capacity to a commercial organization (for example, a wireless cable company).

ORGANIZATIONAL ASPECTS OF DISTANCE EDUCATION PROGRAMS

A majority (60 percent) of distance education institutions coordinate all distance education courses through a centralized program, center, etc. (this program/center may or may not have other responsibilities besides distance education) (Exhibit VIII-17). At a fifth of the institutions (20 percent), two or more academic departments or other organizational units work together to provide distance education courses, and another 9 percent have a hybrid arrangement in which some departments work independently and some work through a centralized program. Academic departments work independently to provide distance education courses at only 8 percent of institutions. The three types of public schools have rather different mixes of organizational strategies. For example, public doctoral schools are less likely than others have a centralized program that coordinates all distance education, but they are more likely than others to have a hybrid arrangement. Public 2-year schools are more likely than others to have academic departments work together to provide distance education.

Decisions about what distance education courses will be offered tend to be shared. The academic department or departments are involved at 71 percent of the schools (ranging from 60 percent of private schools to 82 percent of the public doctorals), and the centralized distance education program or center is involved at 58 percent of schools (from 53 percent of public 2-year schools to 68 percent of the public doctorals). Academic divisions or schools are involved at 40 percent of the institutions (with no appreciable differences by institutional type).

Exhibit VIII-17

HOW THE DELIVERY OF DISTANCE EDUCATION COURSES IS ORGANIZED, BY TYPE OF INSTITUTION

(Institutions That Offer Any For-Credit Distance Education Courses)

	Public Doctoral	Public Comp.	Public 2-Year	All Private Institutions	All Institutions
All are coordinated by a centralized program, center, etc.	▲47*	64	59	65	60
Two or more academic departments or other organizational units work together to provide distance education courses	18	▲11	▲28	14	20
Academic departments work independently to provide distance education courses	11	▲3	8	10	8
Some departments work independently and some work through a centralized program	▲20	▲16	▲3	10	9
Other organizational structure	5	6	3	2	4

*I.e., at 47% of public doctoral institutions that offer distance education courses, all these courses are coordinated by a centralized program, center, etc.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Distance Education questionnaire, question 3.

INSTITUTIONAL POLICIES

Faculty Credit for Teaching Distance Education

According to CAO respondents, only 6 percent of distance education institutions have written policies that provide promotion and tenure credit to faculty for teaching distance education courses. This credit is provided by 3 percent of public 2-year schools, 5 percent of private schools, 10 percent of public doctoral schools, and 12 percent of public comprehensive schools.

Policies Regarding Academic Credit for Distance Education Courses

CAO respondents at 42 percent of the schools that offer technology-based distance education courses reported that their school has limitations on the number of for-credit distance education courses that students can take. (For example, the institution, the state, or another entity requires that students take at least some on-campus courses to obtain a degree.) There are no appreciable differences by institutional type on this issue.

However, about a fifth (18 percent) of the schools that offer technology-based distance education courses offer a sufficient number and variety of courses to make it possible for students in at least some programs to complete an entire degree by enrolling only in courses taught at a distance. Obtaining a degree entirely through distance education is most likely to be possible at public doctoral and private institutions (36 and 28 percent, respectively, allow distance education degrees) and least likely at public 2-year schools (only 8 percent allow distance education degrees). (Twenty-two percent of public comprehensive schools allow a distance education degree.)

FUNDING ISSUES

Cost Recovery Requirements

Slightly over half (58 percent) of Distance Education questionnaire respondents reported that at least some of their school's technology-based distance education courses are required to cover 50 percent or more of their costs; 49 percent said that at least some are required to recover all their costs; and 33 percent said that at least some are required to generate revenues in excess of costs (Exhibit VIII-18). The high percentages of respondents who indicated "have no idea" (15 to 17 percent) suggest that the responses to these questions may not be very reliable.

Exhibit VIII-18

COST RECOVERY REQUIREMENTS FOR TECHNOLOGY-BASED DISTANCE EDUCATION COURSES

(Institutions That Offer Technology-Based Distance Education)

	None	Some	Most	All	Have No Idea
Required to recover at least 50% of their costs	27[*]	9	15	34	16
Required to recover all of their costs	36	11	13	25	15
Required to generate revenues in excess of their costs	51	13	6	14	17

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[*] I.e., at 27% of institutions that offer technology-based distance education courses, none of these courses is required to recover at least 50% of costs.

[▲] This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Distance Education questionnaire, question 33.

Tuition

At the vast majority (81 percent) of schools that offer technology-based distance education, tuition for these courses is about the same as for on-campus courses (Exhibit VIII-19). Fourteen percent reported that distance education tuition is higher, while 4 percent reported that it is lower. Private institutions are the most likely to charge lower tuition for distance education courses than for on-campus courses (19 percent do so), whereas public doctoral institutions are the most likely to charge higher tuition (33 percent do so).

Exhibit VIII-19

TUITION FOR TECHNOLOGY-BASED DISTANCE EDUCATION, BY TYPE OF INSTITUTION

(Institutions That Offer Technology-Based Distance Education)

	Public Doctoral	Public Comp.	Public 2-Year	All Private Institutions	All Institutions
Lower than for on-campus courses	5*	4	0	▲19	4
About the same as for on-campus courses	▲62	79	▲88	77	81
Higher than for on-campus courses	▲33	17	12	▲4	14

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*I.e., 5% of public doctoral institutions that offer technology-based distance education courses charge lower tuition for most of these courses than for on-campus courses.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: Distance Education questionnaire, question 34.

Funding Sources

Funding for technology-based distance education courses appears to come predominantly from distance education tuition and fees and from the institution's general funds, and much less commonly from state/local appropriations for distance education or from other external sources (Exhibit VIII-20). For example, 34 percent reported that more than half of their funding comes from tuition/fees, and 26 percent reported that more than half comes from general funds. In contrast, only 11 and 6 percent receive more than half of their funding from state/local appropriations or other external sources, respectively. However, as with the questions on cost recovery requirements, the relatively large "have no idea" percentages here (12 to 19 percent) suggest that these responses may not be very reliable.

Exhibit VIII-20

PERCENT OF FUNDING FOR TECHNOLOGY-BASED DISTANCE EDUCATION RECEIVED FROM VARIOUS SOURCES

(Institutions That Offer Technology-Based Distance Education)

	None	Less than 10%	10% to 25%	26% to 50%	51% to 75%	More than 75%	Have No Idea
Tuition and fees from students enrolled in technology-based distance education courses	9*	13	12	19	7	27	12
The institution's general or nondedicated funds	25	11	7	15	6	20	16
State and/or local appropriations for distance education	46	11	7	10	5	6	14
Other external sources	49	14	6	6	0	6	19

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*I.e., at 9% of institutions that offer technology-based distance education courses, none of the funding comes from tuition and fees from students in these courses.

Source: Distance Education questionnaire, question 35.

ACCOMPLISHMENTS RELATED TO DISTANCE EDUCATION

As with ratings of accomplishments reported in previous chapters of this report, Distance Education respondents' perceptions of their institution's accomplishments related to distance education are mildly favorable, and there are few differences by institutional type. Overall ratings are shown in Exhibit VIII-21. Between 54 and 64 percent of respondents believe that their institution has done moderately or very well in meeting student needs regarding equipment, technical support, and training to take technology-based distance education courses (64 percent), meeting faculty needs (58 percent), using instructional technologies to improve education (57 percent), and developing clear plans for providing technology-based distance education (53 percent). Providing incentives and rewards to faculty to teach these courses and using communications technologies to enhance student-faculty interactions fared less well; only 32 percent believe that their institution has done moderately or very well on these dimensions.

There are statistically significant differences by institutional type on only two of these items:

- Public doctoral respondents are less likely than others to think that their school has developed clear plans for providing technology-based distance education (means = 2.4 vs. 2.5 to 2.8).
- Public 2-year schools have lower-than-average ratings for use of communications technologies to enhance interactions, and public doctoral schools have higher-than-average ratings. The mean ratings are: public 2-year, 1.9; public comprehensive, 2.3; private, 2.4; and public doctoral, 2.7. (This pattern parallels those on other networking issues, discussed in Chapter IV.)

Exhibit VIII-21

DISTANCE EDUCATION RESPONDENTS' PERCEPTIONS OF THEIR INSTITUTION'S DISTANCE-EDUCATION-RELATED ACCOMPLISHMENTS

(Institutions That Offer Technology-Based Distance Education)

(Listed in Descending Order of Mean Ratings)

	Mean Rating	Not at All	Not Very Well	Moderately Well	Very Well
Met **student** needs regarding equipment, technical support, and training to take technology-based distance education courses	2.8	5*	28	49	15
Met **faculty** needs regarding equipment, technical support, and training to teach technology-based distance education courses	2.7	4	37	44	14
Developed clear plans for providing technology-based distance education	2.6	9	37	37	16
Used instructional technologies to improve the overall quality of education at your institution	2.6	7	35	44	13
Provided incentives and rewards for faculty to teach technology-based distance education courses	2.3	16	51	23	9
Used communications technologies (such as e-mail, networking, etc.) to increase the frequency, convenience, and/or quality of **student-faculty** interactions	2.2	23	46	23	9

Mean ratings are based on a 4-point scale, where 1 = not at all, 2 = not very well, 3 = moderately well, and 4 = very well. Item percentages may not sum to 100 because "have no idea" responses (all less than 5%) are not shown.

*I.e., 5% of respondents reported that, in their opinion, their institution had "not at all" met student needs regarding equipment, technical support, and training to take distance education courses.

Source: Distance Education questionnaire, question 37.

BARRIERS TO INCREASED USE OF TECHNOLOGY-BASED DISTANCE EDUCATION

Considerably the most important impediment to institutions' increased use of technology-based distance education is insufficient funds, considered a major impediment by 55 percent of respondents and a moderate impediment by 28 percent (Exhibit VIII-22). This finding is consistent with others regarding impediments to increased use of technologies, reported in previous chapters.

Other factors that are considered a moderate or major impediment by at least half of the respondents are lack of faculty interest (57 percent), lack of incentives/rewards to faculty to teach distance education courses (60 percent), lack of appropriate equipment (57 percent), lack of strategic planning (55 percent), and lack of appropriate organizational structures (50 percent). Lack of a student market for distance education and state/local policies (such as state limitations on the number of distance education credits a student can accrue) are seen as the least important impediments; 24 and 23 percent, respectively, rated these items as moderate or major impediments.

There are no consistent differences by institutional type in these ratings. The largest differences are with regard to state/local policies. Private institutions are much less likely than their public counterparts to believe that state or local policies create an impediment to their increased use of technology-based distance education (means = 1.2 vs. 1.8 to 2.1).

Exhibit VIII-22

DISTANCE EDUCATION RESPONDENTS' PERCEPTIONS OF IMPEDIMENTS TO THE INSTITUTION'S INCREASED USE OF TECHNOLOGY-BASED DISTANCE EDUCATION

(Institutions That Offer Technology-Based Distance Education)

(Listed in Descending Order of Mean Ratings)

	Mean Rating	Not an Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
Insufficient funds	3.3	7*	9	28	55	1
Lack of faculty interest in teaching distance education courses	2.7	14	30	34	23	0
Lack of incentives/rewards for faculty to teach distance education courses	2.7	17	22	31	29	1
Lack of appropriate equipment	2.7	19	24	29	28	0
Lack of strategic planning	2.6	20	24	33	22	0
Lack of appropriate organizational structures	2.5	25	25	29	21	0
Lack of staff who can provide support for developing/providing distance education courses	2.4	23	28	29	19	0
Lack of top administrators' interest in expanded use of distance education	2.3	38	19	21	22	1
Lack of space	2.3	29	28	23	20	0
Lack of a student "market" for distance education courses	1.8	53	21	14	10	1
State/local policies (e.g., state limitations on the number of distance education credits a student can accrue)	1.8	51	17	14	9	9

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

*I.e., 7% of respondents reported that insufficient funds are not an impediment to their institution's increased use of technology-based distance education.

Source: Distance Education questionnaire, question 36.

EXPECTATIONS FOR THE FUTURE

Expected Changes in Numbers of Distance Education Courses

Virtually all Distance Education and CAO respondents (95 and 92 percent, respectively) think that the number of technology-based distance education courses that their institution offers will increase over the next 3 years (Exhibit VIII-23). The vast majority of Distance Education respondents also expect that the number of distance education courses that use a two-way interactive method and those that may be received in students' homes will increase (82 and 81 percent, respectively). In contrast, only 20 percent expect that the number of distance education courses with no student-instructor interaction will increase. The only appreciable differences by institutional type in these responses are that CAOs in private schools are less likely than those in public schools to think that distance education courses will increase (77 percent vs. 92 to 100 percent).

Exhibit VIII 23

EXPECTATIONS REGARDING THE FUTURE OF TECHNOLOGY-BASED DISTANCE EDUCATION COURSES

(Institutions That Offer Technology-Based Distance Education)

	Doesn't Apply: Don't Offer These Now and Don't Plan to Offer Them	Increase	Stay the Same	Decrease	Have No Idea
Total number of technology-based for-credit distance education courses					
Distance Education respondents (1)	—	95*	3	0	2
CAO respondents (2)	—	92	6	0	2
Number that use a two-way interactive method (1)	8	82	2	1	6
Number with no student-instructor interaction (1)	56	20	10	8	7
Number of technology-based distance education courses that may be received in students' homes (1)	6	81	9	1	2

Mean ratings are based on a 4-point scale, where 1 = not an impediment, 2 = a minor impediment, 3 = a moderate impediment, and 4 = a major impediment.

*I.e., 95% of Distance Education respondents believe that the total number of technology-based for-credit distance education courses offered by their institution is likely to increase over the next 3 years.

Sources: (1) Distance Education questionnaire, questions 15 and 29.
(2) CAO questionnaire, question 11.

Perceived Potential of Distance Education

Among the institutions that currently offer distance education courses, 61 and 65 percent of the CAO respondents indicated that distance education has "a great deal" of potential to help meet their institution's instructional and community service missions, respectively (Exhibit VIII-24). Respondents at private institutions are less likely than others to view distance education's potential positively; only 48 percent of this group indicated that distance education has a great deal of potential.

Respondents whose schools do not currently offer distance education are much less likely than those whose schools do offer it to believe that distance education has potential to help their schools. Nevertheless, sizable minorities of these respondents (32 and 37 percent) gave ratings of "a great deal." Among the non-distance-education schools, distance education's potential is most likely to be viewed positively by those in public 2-year schools and least likely to be viewed positively by private schools.

Exhibit VIII-24

PERCENTAGE OF CAO RESPONDENTS WHO BELIEVE THAT DISTANCE EDUCATION HAS "A GREAT DEAL" OF POTENTIAL, BY TYPE OF INSTITUTION AND CURRENT AVAILABILITY OF DISTANCE EDUCATION COURSES

(Institutions That Offer Technology-Based Distance Education)

	Public Doctoral	Public Comp.	Public 2-Year	All Private Institutions	All Institutions
Institutions that currently offer distance education					
Great deal of potential to meet the institution's instructional mission	65*	62	64	▲48	61
Great deal of potential to meet the institution's community service mission	▲77	68	67	▲48	65
Institutions that currently do NOT offer distance education					
Great deal of potential to meet the institution's instructional mission	29	37	▲52	▲19	32
Great deal of potential to meet the institution's community service mission	35	▲59	▲55	▲23	37

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*I.e., 65% of CAO respondents at public doctoral institutions that offer distance education courses believe that distance education has "a great deal" of potential to help meet their institution's instructional mission.

▲This percentage is statistically significantly different from that for all other types of schools combined ($p < .05$).

Source: CAO questionnaire, question 19.

IX. SURVEY DESIGN AND METHODS

INTRODUCTION

This chapter describes the survey design and methodology, including questionnaire development, sampling, institutional recruitment and data collection, and weighting and analysis procedures.

QUESTIONNAIRE DEVELOPMENT

For the 1994 Study of Communications Technology in Higher Education (CTHE), a total of nine questionnaires were developed:

Individual-level questionnaires:

1. Faculty
2. Students

Institutional-level questionnaires:

3. Use of computers for instructional purposes
4. Use of audio, video, and multimedia instructional technologies
5. Use of instructional technologies in libraries
6. Use of instructional technologies in teacher education
7. Use of instructional technologies in distance education
8. Chief Academic Officer (CAO) perceptions of instructional technology issues
9. Overview (Major questions from questionnaires 3 through 8, developed for use in very small schools and those with little instructional technology activity. For calculating the response rates and analyzing the data, these responses were merged with others in each data set.)

The final version of each questionnaire comprised an 8- to 14-page booklet. Except for some questions that asked for numerical responses, the questionnaires included only closed-ended questions (that is, response categories were specified). The questionnaires are included as appendices to this report. All questionnaires were developed in close collaboration with CPB and were reviewed by CPB's Advisory Committee. In addition, each questionnaire was pretested with 6 to 8 individuals representing the various types of schools included in the survey. Pretests were conducted by telephoning individuals who had been identified as potential respondents for a given questionnaire to ask for their help in pretesting, and then faxing them the questionnaire. This was followed up by a telephone call in which the pretest respondent was asked to answer each question in the questionnaire (to the extent possible) and discuss his/her interpretations of the questions, areas of ambiguity, difficulty in answering, and so on. After the pretests, revisions were made as appropriate. In some cases, pretest respondents were called back to confirm that changes that were made were indeed improvements.

SURVEY SAMPLING METHODS AND DESIGN

Institutions

The sampling frame for the institutional portion of CTHE was the *1994 Higher Education Directory*. The *Directory* is a comprehensive list of accredited higher education institutions in the United States, based on lists provided by a wide range of accrediting organizations.[1] The CTHE institutional sample was stratified into a collapsed version of the Carnegie typology, as follows:

- **Public and Private Doctoral Institutions.** These groups comprise research and other doctorate-granting universities. (The so-called "research universities" comprise the 100 leading universities in federal research funds, and each awards substantial numbers of doctorates across many fields.)
- **Public and Private Comprehensive Institutions.** These schools offer liberal arts and professional programs, and a master's is the highest degree conferred.
- **Liberal Arts Colleges.** Relatively smaller and, on the whole, more selective than comprehensive colleges and universities, these colleges offer primarily bachelor's degrees, although some offer master's degrees. (Almost all are private.)
- **Public and Private 2-Year Colleges.** With only an occasional exception, the highest degree offered by these schools is an associate degree.

The study did **not** include religious institutions (whose primary purpose is to offer religious instruction or train members of the clergy) and other specialized institutions (including medical, other professional, and other specialized degree-granting colleges and universities).

The sample design called for a total sample size of 1,000 institutions, distributed across the various institutional strata so as to achieve approximately equal sampling errors for each stratum. Exhibit IX-1 provides an overview of the sampling strategy, including the population and sample sizes for the various institutional strata. To select the samples, institutions within each stratum were listed in descending order of number of full-time faculty (as estimated by the *Higher Education Directory*), and a systematic random sample of the specified size was selected by computer.

Faculty

Sampling institutions for the faculty survey. To obtain the faculty perspective on uses of instructional technology, the sample design called for surveying 2,000 full-time faculty members at a total of 100 institutions. Because the number of faculty per institution varies substantially both across and within institutional strata, the optimal method of selecting sample members (i.e., the method that produces the smallest overall variance within project budget constraints) was to sample with probability proportional to size. Specifically, in each stratum the number of institutions included in the faculty survey was proportional to the total number of full-time faculty in that stratum. For example, public doctorate-granting institutions employ 30 percent of the total full-time regular faculty, so 30 percent of the institutions selected for the faculty sample were in this stratum. Also, within each stratum, the probability of selecting a given institution was proportional to the institution's number of full-time regular faculty. Thus, an institution with 1,000 faculty had 10 times as many chances of being selected as an institution with 100 faculty. Moreover, all institutions had multiple chances of selection

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[1] Institutions that are accredited at the college level to offer A.A. degrees and beyond typically are referred to as "higher education institutions." Other postsecondary institutions, such as those that offer less-than-2-year programs in vocational and basic education training, are not included under the "higher education" rubric.

Exhibit IX-1

OVERVIEW OF INSTITUTIONAL AND FACULTY SAMPLING STRATEGY

Control and Type of Institution	Number of Institutions	CTHE Sample Size	Estimated Number of Full-Time Regular Faculty and Percent of Total	Average Number of FT Regular Faculty Per Institution	Number of Institutions Selected for Faculty Sample[a]	Total Faculty Sample
Public doctoral	134	105	152,279 30.1%	1,136	26[b]	600
Private doctoral	77	70	56,097 11.1%	729	8[c]	220
Public comprehensive	333	160	104,899 20.7%	315	19[d]	420
Private comprehensive	261	140	38,757 7.7%	148	8	160
Liberal arts	579	190	42,097 8.3%	73	8	160
Public 2-year	970	220	111,627 22.1%	115	19[e]	440
Private 2-year	154	115	—	—	0	—
Total	2,508	1,000	505,756	202	88	2,000

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[a] Institutions were selected randomly with the probability of selection proportional to the number of full-time regular faculty. For each selection, all institutions were eligible, so that any given institution could be selected more than once. For each selection, 20 faculty were selected. (Thus, if an institution was selected twice, a total of 40 faculty were sampled from that institution.)

[b] Includes four institutions that were selected twice.

[c] Includes three institutions that were selected twice.

[d] Includes one institution that was selected three times.

[e] Includes one institution that was selected twice and one that was selected three times.

—This stratum was excluded from the faculty survey.

Source (for population estimates): *1994 Higher Education Directory*.

("sampling with replacement"). For each selection, 20 faculty members were sampled. (Thus, if an institution was selected twice, 40 faculty members were included in the survey.)

Sampling faculty within institutions. When each institution's list of faculty was received, the faculty were categorized, according to their departmental affiliation, into the 11 program areas specified by the National Center for Education Statistics for the 1993 National Survey of Postsecondary Faculty (NSOPF-93) and shown in Exhibit IX-2. (Those lists that were not limited to full-time regular faculty first were reviewed to eliminate staff and ineligible faculty members.) Next, the lists were sorted by program area, and a systematic random sample of 20 individuals (or more if the institution was selected

Exhibit IX-2

HIGHER EDUCATION PROGRAM AREA CATEGORIES

01 Education
- Curriculum and Instruction
- Education Admin/Supervision
- Educational Psychology
- Instructional Design
- Teacher Education
- Other Education, except Basic Studies and Adult, Continuing, and Physical Education

02 Agriculture
- Agribusiness
- Agricultural Econ, Bus, Mgmt
- Agricultural Production
- Agricultural Sciences
- Agronomy
- Animal or Dairy or Fisheries Sci
- Food Distribution Engin or Sci
- Forest Biology Engin or Mgmt
- Horticulture Science
- Parks and Recreation
- Plant Breeding/Genetics/Sciences
- Soil Chemistry/Sciences
- Wildlife/Range Mgmt
- Other Agriculture

03 Business
- Accounting
- Banking and Finance
- Business Admin/Econ/Mgmt
- Business Statistics
- Management
- Marketing and Distribution
- Organizational Behavior
- Other Business

04 Computer Science, Math, Statist
- Computer Programming
- Computer Science
- Information Sciences
- Mathematics
- Operations Research
- Statistics
- Systems Analysis
- Telecommunications
- Other Computer Science, Math, or Statistics

05 Engineering
- Aeronautical Engineering
- Chemical Engineering
- Civil Engineering
- Electrical Engineering
- Industrial Engineering
- Materials Science
- Mechanical Engineering
- Other Engineering

06 Fine Arts
- Art
- Crafts
- Dance
- Design (other than Architecture or Interior Design)
- Dramatic Arts
- Film Arts
- Music
- Photography
- Speech
- Other Visual or Performing Arts

07 Health Sciences
- Audiology
- Behavioral Medicine
- Dentistry
- Environmental Health
- Epidemiology
- Health Services Admin
- Medicine
- Nursing
- Pharmacy
- Psychiatry
- Public Health
- Speech Pathology
- Veterinary Medicine
- Other Health Sciences

08 Humanities
- American Studies
- Archeology
- Art/Music History
- Classics
- Comparative Literature
- English
- Foreign Languages/Literature
- History
- History of Science
- Linguistics
- Literature
- Philosophy
- Religion
- Speech and Debate
- Other Humanities

09 Natural Sciences
- Astronomy
- Atmospheric Sciences
- Biochemistry
- Biology
- Biophysics
- Botany
- Chemistry
- Ecology
- Environmental Sciences

(continued)

09 Natural Sciences (concluded)
- Geology
- Meteorology
- Physical Sciences
- Physics
- Physiology
- Zoology
- Other Life or Physical Sciences

10 Social Sciences
- Advertising
- Anthropology
- Behavioral Sciences
- Broadcasting
- Communications Research
- Demography
- Economics
- Ethnic Studies
- Geography
- Government
- Human Relations
- International Relations
- Political Science
- Psychology
- Public Affairs
- Sociology
- Urban Studies
- Women's Studies
- Other Social Sciences

11 Other
- Adult Education
- Architecture
- Basic Studies
- Communications
- Continuing Education
- Home Economics
- Industrial Arts
- Interior Design
- Journalism
- Law
- Library and Archival Sciences
- Military Science
- Physical Education
- Public Administration
- Radio and Television
- Reading
- Social Work
- Theology
- Vocational Training
- Other

more than once) was selected.[2] For the 66 institutions that included education faculty, this program area was oversampled, with the goal of obtaining a total of approximately 400 education faculty in the sample. To reach this goal, education faculty in institutions with 200 or more total faculty were sampled at five times the overall rate, up to a maximum of half of the total sample selected from the institution. In institutions with fewer than 200 faculty, education faculty were sampled at the regular rate. Exhibit IX-3 presents the distribution of the faculty sample across the 11 program areas.

Exhibit IX-3

DISTRIBUTION OF THE FACULTY SAMPLE BY PROGRAM AREA

Program Area	Number of Faculty Sampled
Education	338
Agriculture	41
Business	128
Computer Science, Mathematics, Statistics	129
Engineering	99
Fine Arts	104
Health Sciences	229
Humanities	276
Natural Sciences	189
Social Sciences	209
Other	258
Total	2,000

Students

For the student survey, the study design called for a random sample of 1,000 students selected through a nationwide survey of households using a random-digit-dialing (RDD) sample provided by Survey Sampling, Inc. For purposes of the survey, "students" were defined as those who had completed two or more college-level for-credit courses during the past 6 months. "For-credit courses" were defined as courses that could be counted for credit in working for a college-level academic degree—an A.A., bachelor's, or master's degree or a doctorate. The incidence rate (i.e., the percentage of households in which students were identified) was 8 percent.

In households in which there was more than one student, only one was interviewed. (To randomly select one student, interviewers asked to speak to the student who had a birthday the most recently.) Eighty-two percent of the respondent households included one student; 14 percent included two students, 2 percent included three students, and 1 percent included four to six students.

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[2] In a few cases—large schools that provided only an alphabetical listing of faculty and staff—it was considered impractical to sort by department.

INSTITUTIONAL RECRUITMENT

Each sampled institution was telephoned to solicit participation in the study and obtain the names, addresses, and telephone numbers of individuals best qualified to complete the institutional-level questionnaires. Interviewers described each questionnaire to potential respondents using general descriptors of anticipated survey topics. (The questionnaires had not been developed at this point, so a precise description of survey topics was not possible.) Of the 1,000 institutions contacted, three (one liberal arts college and two private 2-year colleges) refused to participate and were replaced. Another six institutions (all in Puerto Rico) were replaced because the interviewers could not find appropriate individuals who spoke English. (The latter group consisted of two private comprehensive, one public 2-year, and three private 2-year colleges.)

The recruitment for participation in the faculty survey was conducted as part of the overall institutional recruitment effort. Thus, institutions selected for the faculty survey were telephoned not only to obtain names of institutional-level survey participants but also to obtain a list of their full-time regular faculty.

Of the 88 institutions selected to participate in the faculty survey,[3] 11 (12 percent) refused. The distribution of refusals by type of institution is presented in Exhibit IX-4. Each institution that refused was replaced with a randomly selected institution from within the same type and control stratum and size (small, medium, or large) substratum.

Exhibit IX-4

INSTITUTIONS THAT REFUSED TO PARTICIPATE IN THE FACULTY SURVEY

	Number
Public doctoral	1
Private doctoral	2
Public comprehensive	5
Private comprehensive	0
Liberal arts	1
Public 2-year	2
Total	11

Participating institutions were asked to include in the list all current full-time regular faculty members, as defined by their institution. They were asked not to include acting, affiliate, adjunct, visiting, or emeritus faculty, or those who have research-only appointments. Information requested was the name, department, mailing address, telephone, and fax number (if available) of each listed faculty member. Participants also were told that the preferred format was electronic (e.g., a diskette), but a hard-copy list, sorted by department, also was acceptable. In practice, virtually any form of list was accepted. In the end, 36 schools provided a diskette; 21 provided a hard-copy list including only full-time regular faculty members, sorted by department; 10 provided a faculty/staff directory and list of

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[3] As noted above and presented in Exhibit IX-1, the strategy of sampling with replacement meant that the sample size of 100 institutions produced a final sample of only 88 different institutions.

(all) faculty by department; 13 provided a faculty/staff directory or other list of all faculty, with no department sort; and at 8 schools, the institution selected the sample, pursuant to SRI instructions.

SURVEY DATA COLLECTION

Mail Surveys of Institutional-Level Spokespersons and Faculty

The initial questionnaire mail-out to each of the surveyed groups included a questionnaire, a postage-paid return envelope, and a cover letter explaining the study, stressing the confidentiality of responses, and encouraging participation. To facilitate follow-up, the questionnaire booklet included a label with a respondent identification number.

Data collection took place during the spring, summer, and fall of 1994. It included several rounds of mailings, telephone reminder calls, and, for some of the survey groups, telephone administration of the questionnaire. In addition, respondents to the Overview questionnaire (which included only some of the questions from each of the other institutional questionnaires) were telephoned to obtain additional information. (For example, those who reported that they had access to the Internet or Bitnet were asked the other questions in the Computer questionnaire about these networks.)

Telephone Survey of Students

The student survey was conducted in July 1994. Interviewing was conducted during evening and weekend hours. Up to four attempts were made to reach each sampled household, and callbacks were made as necessary to reach individuals identified as college students within each contacted household. The interviews averaged about 15 minutes in duration.

DATA PROCESSING

Both computer-based and manual editing of data was conducted to identify inconsistencies, range errors, and so on. To the extent possible, corrections were made on the basis of other information provided in the questionnaire. Inconsistencies that could not be resolved were set to "missing." On questions that asked for a written numerical response, respondents who had extreme responses ("outliers") were telephoned to confirm their response.

WEIGHTING PROCEDURES

Institutional-Level Respondents

Institutional-level responses were weighted by type of institution. The weight for each respondent was calculated by dividing the percentage of the population comprised by a given stratum by the percentage of all respondents comprised by that stratum. For example, the 134 public doctoral institutions comprise 5.3 percent of the 2,508 institutions in the survey universe. The 760 CAO responses included 102 from those in public doctoral institutions (13.4 percent of the total). Thus, the weight assigned to a public doctoral respondent in analyzing the CAO results was 5.3 divided by 13.4, or approximately 0.40. Using these weights to calculate sample statistics (percentages, means, etc.) produces an unbiased estimate of the total population of institutions.

The weight for each Teacher Education and Distance Learning questionnaire respondent was calculated using the procedure described above, except that the value for numbers of institutions in each stratum reflected the estimated number of teacher education and distance learning programs in each stratum rather than the total number of institutions. (The estimates of total numbers of programs were based on the percentages of institutions in the sample strata that were identified as having each kind of program.) Similarly, weights for individual questions that applied to only some institutions—e.g., those that have community campus networks—are based on the total estimated number of institutions to which the question applies.

Faculty and Students

The faculty data are weighted by type of institution and by education/non-education department affiliation (the latter to adjust for the oversampling of education faculty).

Student responses are weighted by number of students in the household, to adjust for the fact that respondents in multiple-student households had a lower probability of being interviewed than did those in households with only one student.

DATA ANALYSES

Analyses of the various survey data sets consisted of tabulating (weighted) frequency distributions showing the percentage of the entire respondent group that gave each potential response, calculating mean ratings on scaled variables, and comparing the responses of various subgroups of respondents with one another, using SRI proprietary programs to assess the statistical significance of the observed differences. Three significant features of the CTHE data sets produced unusual analytical requirements:

- All data sets involve weighted data. Analysis programs testing the statistical significance of subgroup differences must take the weighting into account to obtain a correct assessment of the differences. The software SRI often uses (SAS) does not do this in its *t*-test and ANOVA subprograms. (Although SRI has previously developed proprietary programs for use with weighted data, the two features described below produced additional requirements.)
- The institutional samples comprise an appreciable proportion of the total population of institutions. The result of this phenomenon is that "ordinary" tests of statistical significance, which assume that the sample is a very small proportion of the population, will often underreport significant differences. Thus, programs had to be written that incorporated a "finite population correction" into the tests of statistical significance.
- The faculty were sampled by using a two-step cluster design (i.e., a subset of institutions was selected from the main sample and then groups of faculty were selected from each institution in the subset). Since it was possible that faculty in the same institution were more similar to each other than to faculty in other institutions, it was necessary to develop analysis programs that measured any clustering effect and then took it into account in assessing the statistical significance of subgroup differences. (As it turned out, however, there is very little clustering effect.)

REPORTING

Unless otherwise noted, all survey results that are reported are based on weighted data. Comparisons noted in this report are significant at the .05 level of significance, as determined by a pairwise *t*-test for independent samples (with adjustments as described above). In essence, a difference that is found to be significant at the .05 level has a 95 percent probability that it would not have occurred simply by chance.

Appendix A

ADVISORY PANEL MEMBERS

ADVISORY PANEL MEMBERS

Ms. Judith Axler-Turner
Director for Chronicle Information Services
Chronicle for Higher Education
Washington, DC

Mr. George H. Brett II
Director
Clearinghouse for Networked Information
Discovery and Retrieval-MCNC
Center for Communications
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Dr. Randall Bretz
Project Manager, NebraskaNet
Nebraska Educational Telecommunications
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Ms. Jinny Goldstein
Vice President, Education Projects
Public Broadcasting Service
Alexandria, VA

Ms. Sally M. Johnstone
Director
Western Cooperative for
Educational Telecommunications
Boulder, CO

Dr. Greg Kearsley
George Washington University
Department of Educational Leadership
Washington, DC

Dr. Peter Lyman
University Librarian and
Dean, University Libraries
University of Southern California
Los Angeles, CA

Dr. Anne Raymond-Savage
Associate Vice President for Academic Affairs
Life Long Learning and
Academic Television Services
Old Dominion University
Norfolk, VA

Ms. Susan Rogers
Director of Distance Learning
Rochester Institute of Technology
Rochester, NY

Dr. Steve Sachs
Associate Dean for Instructional Technologies
and Extended Learning
Northern Virginia Community College
Annandale, VA

Dr. Michael Strait
Project Officer, Research and Evaluation
CPB/Annenberg
Washington, DC

Appendix B

SURVEY QUESTIONNAIRES

1994 STUDY OF COMMUNICATIONS TECHNOLOGY IN HIGHER EDUCATION

Student Interview

Date: ____________________ Interview Number: ____________

Time started: ________ AM PM Interviewer: ________________________________

Time ended: ________ AM PM

INTRODUCTION: Hello, this is ____________, calling for Stanford Research Institute. We're conducting a nationwide survey for the Corporation for Public Broadcasting.

1. During the past 6 months, has anyone currently living in your household been enrolled in any college or university courses? (PROBE: That is, any graduate or undergraduate courses from a junior college, a community college, a 4-year college or university, a professional school such as a law, medical, or business school, or some other kind of higher education institution.)

Yes	1	☛	*Continue*
No	2	☛	*Terminate interview*
Don't know	8	☛	*Ask to speak to someone else who might know; schedule callback*
Refusal	9	☛	*Terminate interview*

2. How many people currently living in your household have completed **two or more** college-level courses **for credit** during the past 6 months? (PROBE: By "for-credit," I mean courses that could be counted for credit in working for a college-level academic degree--an A.A. or bachelors degree, a masters degree, or a doctorate.)

None	0	☛	*Terminate interview*
One	1	☛	*Ask question 3*
More than one *(specify:)*	______	☛	*Skip to question 4*
Don't know	8	☛	*Ask to speak to someone else who might know; schedule callback*
Refusal	9	☛	*Terminate interview*

3. May I please speak with that person?

Speaking	1	☛	*Skip to question 6*
Correct person comes to the phone	2	☛	*Skip to question 5*
Correct person not available	3	☛	*Schedule callback*
Refusal	9	☛	*Terminate interview*

4. May I please speak with whichever of those [*number given in question 2*] people has had a birthday most recently?

Speaking	1	☛ *Skip to question 6*
Correct person comes to the phone	2	☛ *Ask question 5*
Correct person not available	3	☛ *Schedule callback*
Refusal	9	☛ *Terminate interview*

5. Hello, this is ____________, calling for Stanford Research Institute. We're conducting a nationwide survey of college and university students for the Corporation for Public Broadcasting. I understand that you have completed two or more college-level courses for credit in the past 6 months. Is that correct? (PROBE: By "for-credit," I mean courses that could be counted for credit in working for a college-level academic degree--an A.A. or bachelors degree, a masters degree, or a doctorate.)

Yes	1	☛ *Ask question 6*
No	2	☛ *Terminate interview or speak to another person in household, as appropriate*
Refusal	9	☛ *Terminate interview*

6. This is a confidential research study about college students' use of computers and audio, video, and multimedia technologies. It will take about 15 minutes. (ADD IF NECESSARY: We are not selling anything, and no salesperson will call on you. If you like, we will send you a copy of the study results.) My first question is about the academic term that you most recently completed? What did your school call this term? (PROBE: Spring term? Spring semester?)

Spring term	1
Spring semester	2
Spring quarter	3
Other (*specify*:) ______________________	4
Don't know	8
Refusal	9

7. During the past *[term]*, did you use a computer for any purpose? (PROBE: For school, a job, games, any purpose at all.)

Yes	1	☛ *Skip to question 9*
No	2	} *Ask question 8*
Don't remember	8	
Refusal	9	

8. Do you plan to buy a computer within the next year, or expect to receive one as a gift?

Yes	No	DK	Refusal
1	2	8	9

☛ ***Skip to question 52, on page 9***

9. **Do you own your own computer? (IF COMPUTER BELONGS TO PARENTS BUT RESPONDENT HAS FULL-TIME USE AT SCHOOL, CODE AS "YES.")**

Yes .... 1 ☛ *Skip to question 14*

No... 2 } *Ask question 10*
Refusal 9

10. **Do you plan to buy a computer within the next year, or expect to receive one as a gift?**

Yes	No	DK	Refusal
1	2	8	9

11. Does your school provide you with a PC or a Mac **for your sole use**?

Yes .... 1 ☛ *Skip to question 14*

No... 2 } *Ask question 12*
Refusal 9

12. Do you usually have access to a computer--that is a PC or a Mac-- that you can use when you need one to do school work?

Yes	No	DK	Refusal	Doesn't apply: Never need one for school work
1	2	8	9	0 ☛ *Skip to Q22, page 5*

13. During the past *[term]*, did your school have any open-access PCs or Macs that you could use? By "open-access," we mean usually available for general use by students and/or faculty. (THE ISSUE HERE IS ARE THERE OPEN-ACCESS MACHINES; CIRCLE YES IF THEY ARE AVAILABLE, EVEN IF THEY'RE ALMOST ALWAYS OCCUPIED.)

Yes	No	DK	Refusal
1	2	8	9

14. During the past *[term]*, did you have access to a mainframe, minicomputer, and/or supercomputer at your school? You would access one of these larger computers through a PC, a computer terminal, or a workstation.

Yes	No	DK	Refusal
1	2	8	9

15. Does the computer that you use most often for school work have a modem? (PROBE: That is, a device that provides dial up access to other computers, networks, and so on.)

Yes	No	DK	Refusal
1	2	8	9

16. During the past *[term]*, how often did you use a computer in doing your school work? My categories are never, once or twice, less than once a week, about once a week, more than once a week, or every day?

Never	Once or Twice	Less Than Once a Week	About Once a Week	More Than Once a Week	Every Day	DK	Ref.
0	1	2	3	4	5	8	9

☛ *If "never," skip to question 22, on page 5*

17. During the past *[term]*, did you use word processing software at all in doing your school work? (PROBE: For example, WordPerfect or Word.)

Yes	No	DK	Refusal
1	2	8	9

18. (During the past *[term]*), did you use any other kinds of software in doing your school work?

Yes ....1 ☛ *Ask question 19*
No..2 ☛ *Skip to question 20*
Don't know ....8 ☛ *Ask question 19*
Refusal.......................................9 ☛ *Skip to question 20*

19. (During the past *[term]*), did you use [READ FIRST ITEM] at all in your school work? [RECORD RESPONSE AND CONTINUE THROUGH LIST.]

	Yes	No	DK	Ref.
a. Spreadsheets or other business applications, such as Lotus or Excel	1	2	8	9
b. Database packages, such as dBase or Paradox	1	2	8	9
c. Statistical analysis packages, such as Minitab, SPSS , SAS , or Systat	1	2	8	9
d. Graphics packages, such as Harvard Graphics or MacDraw	1	2	8	9
e. Desk-top publishing packages, such as PageMaker, QuarkXPress, or FrameMaker	1	2	8	9
f. Authoring tools, such as HyperCard, Toolbook, or Linkway	1	2	8	9
g. Presentation programs, such as Powerpoint or Persuasion	1	2	8	9
h. Engineering software, such as computer-assisted design	1	2	8	9
i. Instructional software designed to teach specific subject matter	1	2	8	9

20. As part of your school work during this past *[term]*, did you ever [READ FIRST ITEM]? [RECORD RESPONSE AND CONTINUE THROUGH LIST.]

	Yes	No	DK	Ref.
a. Access any computerized bibliographic resources, such as online card catalogs, DIALOG, or ERIC	1	2	8	9
b. Access any computerized full-text resources--for example, computerized encyclopedias or news services	1	2	8	9
c. Use a computer to access any other kind of data base	1	2	8	9

☛ ***If no or don't know on all of question 20 (a through c), skip to question 31, on page 6***

21. Overall, how useful has the ability to access information electronically been to you in your school work? Not at all useful, not very useful, moderately useful, or very useful?

Not At All	Not Very Useful	Moderately Useful	Very Useful	DK	Ref.
1	2	3	4	8	9

☛ ***Skip to question 31, on page 6***

(QUESTIONS 22-30 ARE FOR RESPONDENTS WHO DO NOT USE COMPUTERS FOR SCHOOLWORK.)

22. During the past *[term]* did you have access to the Internet?

Yes	No	DK	Refusal
1	2	8	9

23. During the past *[term]*, did you have access to Bitnet?

Yes	No	DK	Refusal
1	2	8	9

☛ ***If no access to the Internet or Bitnet, skip to question 52, on page 9***

24. How do you get access to the Internet/Bitnet? (PROBE: Through your school, an employer, a commercial service such as CompuServe or America Online, a community or public access network, or some other way?) (CIRCLE ALL THAT APPLY)

School	Employer	Commercial service (CompuServe, America Online, GEnie, Prodigy, etc.)	Community/ Public Access	Other	DK	Ref.
1	2	3	4	5	8	9

	Yes	No	DK	Ref.
25. Do you (yourself) have to pay to use any Internet/Bitnet services?	1	2	8	9
26. During the past *[term]*, did you ever log on to any UseNet news groups?	1	2	8	9
27. (During the past *[term]*,) did you ever send or receive any e-mail messages? (Q'S 27-30 ARE NOT LIMITED TO INTERNET/BITNET ACTIVITIES)	1	2	8	9
28. (During the past *[term]*,) did you do any computer conferencing--that is, real-time online conversations with one or more other individuals?	1	2	8	9
29. (During the past *[term]*,) did you ever log on to computers at other schools or other organizations--for example via telnet?	1	2	8	9
30. (During the past *[term]*,) did you ever use programs or files that were maintained on a file server? (A file server is a computer that provides shared access to software programs or data files for multiple users on a network.)	1	2	8	9

☛ ***Skip to question 52, on page 9***

31. (During the past *[term]*,) Did you have access to the Internet?

Yes	No	DK	Refusal
1	2	8	9

32. (During the past *[term]*,) Did you have access to Bitnet?

Yes	No	DK	Refusal
1	2	8	9

☛ ***If no access to the Internet or Bitnet, skip to question 36***

33. How do you get access to the Internet/Bitnet? (PROBE: Through your school, an employer, a commercial service such as CompuServe or America Online, a community or public access network, or some other way?) (CIRCLE ALL THAT APPLY)

School	Employer	Commercial service (CompuServe, America Online, GEnie, Prodigy, etc.)	Community/ Public Access	Other	DK	Ref.
1	2	3	4	5	8	9

	Yes	No	DK	Ref.
34. Do you (yourself) have to pay to use any Internet/Bitnet services?	1	2	8	9
35. During the past *[term]*, did you ever log on to any UseNet news groups?	1	2	8	9

☛ ***Skip to question 37***

36. During the past *[term]*, did you use any kind of computer network services, such as e-mail, online bulletin boards, shared software, or electronic transferring of computer files?

Yes	1	☛ *Ask question 37*
No	2	*Skip to question 49*
Don't know	8	
Refusal	9	

	Yes	No	DK	Ref.
37. During the past *[term]*, did you ever log on to any online bulletin boards (other than UseNet news groups)?	1	2	8	9
38. (ASK IF YES ON Q35 AND/OR Q37) Was any of your online news group or bulletin board activity during the past *[term]* done as part of your school work?	1	2	8	9
39. (During the past *[term]*,) did you ever send or receive any e-mail messages?	1	2	8	9
40. (ASK IF YES ON Q39) Did you use e-mail at all to communicate with other students about your school work?	1	2	8	9
41. (ASK IF YES ON Q39) Did you use e-mail at all to communicate with any of your **instructors** about your school work?	1	2	8	9

	Yes	No	DK	Ref.
42. (During the past *[term]*,) did you do any computer conferencing--that is, real-time online conversations with one or more other individuals?	1	2	8	9
43. (ASK IF YES ON Q42) Did you use computer conferencing at all to communicate with other students about your school work?	1	2	8	9
44. (ASK IF YES ON Q42) Did you use computer conferencing at all to communicate with any of your **instructors** about your school work?	1	2	8	9
45. (During the past *[term]*,) did you ever log on to computers at other schools or other organizations--for example via telnet?	1	2	8	9
46. (During the past *[term]*,) did you ever use a File Transfer Protocol, or FTP, to transfer files through a network between your computer and another computer?	1	2	8	9
47. (During the past *[term]*,) did you ever use programs or files that were maintained on a file server? (A file server is a computer that provides shared access to software programs or data files for multiple users on a network.)	1	2	8	9

48. To what extent, if at all, do you think technologies such as e-mail and networking have increased the frequency, convenience, and/or quality of your interactions with faculty? Not at all, not very much, a moderate amount, or a great deal?

Not At All	Not Very Much	A Moderate Amount	A Great Deal	DK	Ref.
1	2	3	4	8	9

49. My next questions are about things that keep you from using computer networks (even) more than you do now. The kinds of computer network activities I'm talking about are e-mail, online bulletin boards, transferring computer files, and accessing computerized bibliographic and full-text resources. The first item is [READ ITEM a]. Would you say that this is not a barrier to your increased use of computer networks, is it a minor barrier, a moderate barrier, or a major barrier? [PROBE: How much do you think this keeps you from using computer networks?] [CONTINUE THROUGH LIST]

	Not A Barrier	A Minor Barrier	A Moderate Barrier	A Major Barrier	DK	Ref.
a. Lack of training in how to do these things	1	2	3	4	8	9
b. Amount of time required to learn how to do these things	1	2	3	4	8	9
c. Lack of awareness that you can do these things	1	2	3	4	8	9
d. Not having access to networks	1	2	3	4	8	9
e. Your own lack of interest in doing these things	1	2	3	4	8	9

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50. As far as you know, does your school provide any courses, help sheets, hot lines or other assistance to students in any of the following kinds of computer use? [READ FIRST ITEM ON LIST AND RECORD RESPONSE. IF YES, ASK:] Have you yourself received any of this (from your school)? [RECORD RESPONSE AND CONTINUE THROUGH LIST]
INCLUDE TRAINING THAT IS PROVIDED ONLY TO CERTAIN TYPES OF STUDENTS--E.G., ENGINEERING MAJORS, OR STUDENTS ENROLLED IN, SAY, A WRITING COURSE.

	Courses/Assistance Provided?				Has Respondent Received Any?			
	Yes	No	DK	Ref.	Yes	No	DK	Ref.
a. General computer use	1	2	8	9	1	2	8	9
b. Using word processing software	1	2	8	9	1	2	8	9
c. Using other kinds of software	1	2	8	9	1	2	8	9
d. How to access and search an on-line card catalog or other bibliographic resources	1	2	8	9	1	2	8	9
e. How to access online full-text resources, such as NEXIS, Dow-Jones, or Reuters	1	2	8	9	1	2	8	9
f. How to use the Internet or Bitnet	1	2	8	9	1	2	8	9
g. How to access or participate in online bulletin boards or computer conferences	1	2	8	9	1	2	8	9

51. How much of a barrier is each of the following to your increased use of computers, generally, in doing your school work? The first item is [READ ITEM a]. Would you say that this is not a barrier, is it a minor barrier, a moderate barrier, or a major barrier? [PROBE: How much do you think this keeps you from using computers more in your school work?] [CONTINUE THROUGH LIST]

	Not A Barrier	A Minor Barrier	A Moderate Barrier	A Major Barrier	DK	Ref
a. Lack of training in how to use computers or in specific computer applications	1	2	3	4	8	9
b. Amount of time required to learn how to use computers	1	2	3	4	8	9
c. The difficulty of learning	1	2	3	4	8	9
d. Lack of convenient access to computers	1	2	3	4	8	9
e. The expense of computers and computer accessories	1	2	3	4	8	9
f. Not having appropriate software	1	2	3	4	8	9
g. Lack of use of computer technologies by your instructors	1	2	3	4	8	9
h. Lack of use of computer technologies by your school, generally	1	2	3	4	8	9
i. Your own lack of interest in using computers	1	2	3	4	8	9

52. My next questions are about what we call "distance education." [READ SLOWLY:] By "distance education," we mean courses in which you received instruction at your home, your workplace, a different campus than where the instructor was, or at some other location. A couple of examples are courses in which you watched the instructor on television and correspondence courses. The major element in what we mean by distance education is that the instruction is not provided in-person. Keeping this definition in mind, have you ever taken any distance education courses, either for credit or not?

Yes .... 1 ☛ *Ask question 53*
No... 2 } *Skip to question 63B, on page 11*
Refusal .... 9 }

53. About how many distance education courses have you taken? (My categories are 1 to 5, 6 to 10, or more than 10.)

1 - 5	6 - 10	More Than 10	DK	Refusal
1	2	3	8	9

54. Did you take any **for-credit** distance education courses during the past *[term]*?

Yes .... 1 ☛ *Ask question 55*
No... 2 } *Skip to question 63B, on page 11*
Refusal .... 9 }

55. How many?

One	Two	Three or More	Refusal
1	2	3	9

56. I'm going to read a list of possible ways that distance education can be provided, and I'd like you to tell me which ways you received instruction in your distance education course(s) this past *[term]*. First, what about [READ FIRST ITEM]? [CONTINUE THROUGH LIST.]

	Yes	No	DK	Ref.
a. Live video or live television	1	2	8	9
b. Any pre-recorded television or videotapes	1	2	8	9
c. Any live audio, without video	1	2	8	9
d. Any audiotapes	1	2	8	9
e. Any on-line computer communication from the instructor	1	2	8	9
f. Any self-paced computer-based instruction	1	2	8	9
g. Any textbooks or other written, paper-copy, materials (INCLUDE PRINT-BASED CORRESPONDENCE COURSES HERE)	1	2	8	9

57. And in which of the following ways did you communicate with the instructor in this course/these courses? (READ LIST)

	Yes	No	DK	Ref.
a. Via live, interactive video during the delivery of instruction	1	2	8	9
b. Via live, interactive audio during the delivery of instruction	1	2	8	9
c. Via on-line computer communication during the delivery of instruction	1	2	8	9
d. Via e-mail	1	2	8	9
e. Via telephone	1	2	8	9
f. Via correspondence (for example, through the mail)	1	2	8	9
g. Via occasional in-person meetings	1	2	8	9

58. Where did you receive most of the instruction for these courses? In your home, workplace, the main campus of your school, a branch or satellite campus of your school, or some other location? (CIRCLE ONE RESPONSE)

Home	1	*Skip to question 60*
Workplace	2	
Main campus of your school	3	
Branch or satellite campus of your school	4	☛ *Ask question 59*
Other location	5	*Skip to question 60*
Refusal	9	

59. As far as you know, does regular face-to-face instruction also occur at that campus?

Yes	No	DK	Refusal
1	2	8	9

60. My next questions are about your reasons for taking this/these course(s) as distance education courses rather than as conventional, face-to-face courses. For each reason that I read, please tell me whether it was not a reason for you or whether it was somewhat important for you or very important. The first item is [READ FIRST ITEM]. Was this not a reason for you, was it somewhat important, or very important? [CONTINUE THROUGH LIST.]

	Not A Reason	Somewhat Important	Very Important	Ref.
a. This was the only way the course was offered	1	2	3	9
b. The quality of the faculty	1	2	3	9
c. On-campus courses were too far away	1	2	3	9
d. Greater scheduling flexibility	1	2	3	9
e. You thought the course might be easier through distance education than if it were face-to-face	1	2	3	9
f. Your handicaps or disabilities make it difficult to take face-to-face courses	1	2	3	9
g. Taking the course this way fit in better with your work or home responsibilities	1	2	3	9

61. Overall, do you think you have learned more effectively in distance ed courses than in conventional face-to-face courses, equally effectively in the two types of courses, or less effectively in distance ed courses than in face-to-face courses?

More effectively in distance ed courses 1
Equally effectively 2
Less effectively in distance ed courses 3
Too variable to say 4
Don't know 8
Refusal 9

62. Were these the only courses that you took during the past *[term]*?

Yes ....1 ☛ ***Skip to question 64***
No..2
Refusal ....9 } ***Ask question 63A***

63A. My next questions are about the conventional, face-to-face courses you took during the past *[term]*. In any of these courses, [READ FIRST ITEM ON LIST FOLLOWING 63B]. [RECORD RESPONSE IN GRID BELOW AND CONTINUE THROUGH LIST.]

63B. In any of the courses that you took during this past *[term]*, [READ FIRST ITEM ON LIST]. [RECORD RESPONSE AND CONTINUE THROUGH LIST.]

	Yes	**No**	**DK**	**Ref.**
a. Did you listen to audio materials created specifically for instructional use, such as language tapes or lectures?	1	2	8	9
b. Did you listen to audio recordings of music, entertainment, news broadcasts, or documentaries?	1	2	8	9
c. Did you watch video materials created specifically for instructional use, such as lectures or classroom presentations?	1	2	8	9
d. Did you watch other kinds of video, such as documentaries or entertainment? (PROBE: Remember, this is as part of a course.)	1	2	8	9
e. Did any of your instructors ever use multi-media materials in classroom presentations--that is, a computer controlled combination of text, audio, and/or video?	1	2	8	9
f. Did you use multi-media materials in a self-paced individualized instruction program?	1	2	8	9
g. Did any of your instructors ever use a computer in the classroom to give a demonstration or presentation?	1	2	8	9
h. Did you have any class sessions in a room that had computers for individual student use?	1	2	8	9
i. Did you have any class sessions in a high-tech classroom where a computer controlled multiple media devices such as videodisc players, VCRs, and projection equipment? (Do not include computer labs, language labs, or rooms with other kinds of individual work stations.)	1	2	8	9

64. In your opinion, how well has your school met student needs regarding equipment, technical support, and training to use computers and audio, video, and multimedia technologies? My response categories are not at all, not very well, moderately well, or very well.

Not At All	Not Very Well	Moderately Well	Very Well	DK	Ref.
1	2	3	4	8	9

65. To what extent, if at all, do you think computers and audio, video, and multimedia technologies improved the overall quality of education that you have received? [READ CATEGORIES 1 THROUGH 4 IF NECESSARY]]

Not At All	Not Very Much	A Moderate Amount	A Great Deal	DK	Ref.
1	2	3	4	8	9

66. During this past *[term]*, did you live on campus or off campus? (CODE AS "ON-CAMPUS" IF RESPONDENT LIVED ON CAMPUS DURING ANY PART OF THE TERM.)

On-campus .... 1 ☛ *Ask question 67*
Off-campus .... 2 } *Skip to question 68*
Refusal .... 9 }

67. In your (on campus) room at school, did you have [READ FIRST ITEM ON LIST]?

	Yes	No	DK	Ref.
a. A cable TV outlet	1	2	8	9
b. A telephone	1	2	8	9
c. (ASK IF YES ON Q67b:) Did you have "voice mail" on this phone? (PROBE: Voice mail is like a built-in answering machine on a phone system.)	1	2	8	9

68. My last questions are to help us interpret your responses to my other questions. During this past *[term]*, did your school consider you to be a full-time student or a part-time student?

Full-time 1
Part-time 2
Don't know 8
Refusal 9

69. What is the full name of your school? (OKAY TO USE U FOR UNIVERSITY; NO OTHER ABBREVIATIONS)

____

What city and state is it in? (PROBE: The campus you attended.)

City: __________________________

State: ______________________

(CODERS:) FICE Code: ______________________

70. During this past *[term]*, what academic year were you in--freshman, sophomore, grad student...?

Freshman	1
Sophomore	2
Junior	3
Senior	4
Graduate student	5
No academic year (not seeking a degree/ just taking courses)	6
Refusal	9

71. Did you have a major field or area of study, either officially or unofficially?

Yes	1	☛ *Ask question 72*
No	2	} *Skip to question 73*
Not sure	8	
Refusal	9	

72. What was it? [USE FIELDS OF STUDY SHEET AS NECESSARY TO WORK WITH RESPONDENT TO SELECT BEST CATEGORY.]

Agriculture (including parks and recreation, wildlife or range management)	01
Biological, life, or physical sciences, other than health sciences (including astronomy, botany, chemistry, ecology, environmental sciences, geology, physics, zoology	02
Business (including accounting, finance, management, marketing, organizational behavior)	03
Computer science, math, or statistics	04
Education (other than adult, continuing, or physical education or basic studies)	05
Engineering	06
Fine or performing arts (including crafts, dance, music, photography, speech)	07
Health sciences (including medicine, nursing, dentistry, pharmacy, veterinary medicine)	08
Humanities (including art or music history, English, literature, history, foreign languages, philosophy, religion)	09
Social or behavioral sciences (including advertising, anthropology, economics, government, political science, psychology, sociology)	10
Other fields (including adult, continuing, or physical education, basic studies, journalism, communication, law, library science, public administration, social work, theology, vocational training) (*specify*:) ________________	11
Refusal	99

73. Which one of the following categories describes your current age? [READ CATEGORIES 1-6]

17 to 20	21 to 24	25 to 34	35 to 44	45 to 54	55 or Older	Ref.
1	2	3	4	5	6	9

74. Which one of the following best describes your race/ethnicity? [READ CATEGORIES 1-6]

Asian or Pacific Islander 1
Black or African-American 2
Caucasian or White 3
Hispanic or Latino 4
Native American, American Indian or Alaska Native 5
Other *(specify below:)* 6

____

Refusal 8

75. [RESPONDENT'S GENDER:)

Male 1
Female 2

76. IF STUDY RESULTS WERE MENTIONED AS AN INCENTIVE, ASK: Would you like to receive a copy of the study results?

Yes 1
No 2

(IF "YES") The results probably will be sent out in November or December. What name and mailing address should we send them to? [RECORD ON STUDY RESULTS SHEET]

That's all the questions I have. Let me just confirm that I reached you at [STATE AND RECORD AREA CODE AND PHONE NUMBER:)

Phone: (______) ____________________________

Name: __________________________________

Thank you very much for your participation.

CORPORATION FOR PUBLIC BROADCASTING
A Quarter Century of Quality Programming

901 E Street, NW
Washington, DC 20004-2037
(202) 879-9600

Chief Academic Officer Questionnaire

This study is endorsed by:

- *American Association of Colleges for Teacher Education*
- *American Association of Community and Junior Colleges*
- *American Association for Higher Education*
- *American Association of State Colleges and Universities*
- *Association of American Colleges*
- *CAUSE (Association for Information Technology Managers)*
- *Council of Independent Colleges*
- *Educom*
- *National Association of State Universities and Land-Grant Colleges*
- *National University Continuing Education Association*

Spring, 1994

Dear Chief Academic Officer:

The Corporation for Public Broadcasting (CPB) is conducting a comprehensive, multi-faceted national survey of 1,000 higher education institutions on the instructional uses of communications technology, including audio, video, multimedia, and computers. (CPB is a private, non-profit corporation created by Congress in 1967 to oversee the growth of public radio and television in the United States.) This study will help us plan for the future of public telecommunications, and it will help educators, policymakers, and funders and producers of educational programming develop better and more effective products.

The study includes six institutional-level questionnaires designed to assess:

- Institutional policies and chief academic officers' perceptions of current and future use of instructional technologies.
- Availability and ways in which computers are used for instructional purposes.
- Use of audio, video, and multimedia technologies in the classroom.
- Use of audio, video, multimedia, and computer technologies in teacher education.
- Use of distance education technologies.
- Use of computer-based technologies in the libraries.

Two additional questionnaires will assess faculty and student experiences and opinions about computers and other instructional technologies.

This questionnaire concerns institutional policies and the chief academic officer's perceptions of current and future use of instructional technologies at your institution. *Your participation is very important to the overall accuracy of the survey results*. Your responses will be held strictly confidential.

In appreciation for your participation, we will provide you with a summary report of the study results. In addition, we will be pleased to work with you or another representative of your institution to provide a customized analysis of the study data.

Please complete this questionnaire as soon as possible and return it in the enclosed business-reply envelope. CPB has engaged SRI International (formerly Stanford Research Institute) to conduct this study. If you have any questions, please contact SRI project director Dr. Susan Russell, at 415/859-4164, or CPB project coordinator Ms. Wendy Charlton, at 202/879-9672.

Thank you in advance for your cooperation.

Sincerely,

Robert T. Coonrod
Executive Vice President

1994 STUDY OF COMMUNICATIONS TECHNOLOGY IN HIGHER EDUCATION

Chief Academic Officer Questionnaire

☛ In this questionnaire, we use the term "**instructional technologies,**" to mean computers and video, audio, multimedia, and other technologies used to teach and/or enable student learning. These include the following:

Computers: Microcomputers (PCs and Macs), workstations (Suns, NeXTs, etc.), minicomputers, mainframe computers.

Video technologies (carry picture and sound): Broadcast, cable, or closed-circuit television; videocassettes; videodiscs; video projection systems.

Audio technologies (carry sound only): audio cassettes, audiotapes, audio CDs, records, radio.

Multimedia: Computer-mediated integration of text, audio, and/or video technologies --for example, microcomputers linked to and controlling videodisc players, CD ROMs, video/audio projection units, or slide or video digitizers.

1. Does your institution have any written policies regarding faculty/student access to or use of instructional technologies?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1

No .... 2 ☛ *Please skip to question 3*

2. Which of the following are addressed in these policies?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Access to computers by faculty and/or students 1

Access to Internet/Bitnet by faculty and/or students 2

Access to multimedia, audio, and video equipment by faculty and/or students 3

Access to library electronic document delivery services by faculty and/or students 4

Access to online library card catalogs 5

Promotion and tenure credit for software/courseware development 6

Promotion and tenure credit for using instructional technologies in the classroom 7

Promotion and tenure credit for teaching distance education courses 8

Privacy and confidentiality issues in the use of instructional technologies 9

Freedom of speech issues in the use of computers 10

Computer ethics 11

Duplication of copyrighted software 12

Requirements regarding the computer literacy of new faculty 13

Requirements regarding the computer literacy of existing faculty 14

3. Which one of the following best describes your institution's primary focus in recruiting students?
(PLEASE CIRCLE ONE NUMBER)

Local.................................... 1

State.................................... 2

Regional................................ 3

National................................ 4

International.......................... 5

4. Does your institution have any requirements regarding computer use or familiarity that undergraduate students must meet **before enrollment**?
(PLEASE CIRCLE ONE NUMBER)

☛ ***All questions about students refer to full-time and part-time students taking courses for credit at your institution.***

Yes, for all undergraduates 1

Yes, for some undergraduates (e.g., those intending to major in some disciplines) 2

No.. 3

No, but we plan to do so within the next 3 years...... 4

5. Does your institution currently have any requirements regarding computer use or familiarity that undergraduate students must meet **before graduation**?
(PLEASE CIRCLE ONE NUMBER)

Yes, for all undergraduates 1

Yes, for some undergraduates................................. 2

No.. 3

No, but we plan to do so within the next 3 years...... 4

6. Does your institution currently require that undergraduate students own (or have sole use of) a personal computer for use in their coursework or study?
(PLEASE CIRCLE ONE NUMBER)

Yes, for all undergraduates 1

Yes, for some undergraduates................................. 2

No.. 3

No, but we plan to do so within the next 3 years...... 4

7. Does your institution currently offer any for-credit print-based **correspondence courses**, at either the undergraduate or graduate level?

(PLEASE CIRCLE ONE NUMBER)

Yes 1
No 2

8. Does your institution offer any **for-credit** technology-based distance education courses, at either the undergraduate or graduate level?

☛ By **"technology-based distance education,"** we mean the delivery of instruction by audio, video, and/or computer technologies to students, most of whom are located at a **remote off-campus site or sites (including their homes)**, physically removed from the instructor. Do not include print-based correspondence courses or courses in which the only distance education component is an accommodation for students with disabilities.

(PLEASE CIRCLE ONE NUMBER)

Yes 1
No .... 2 }
No, but we plan to do so within the next 3 years .... 3 } *Please skip to question 11*

9. Are there any limitations on the number of for-credit distance education courses that students at your institution can take? (For example, does your institution, the state, or other entity require that students take at least some on-campus courses in order to obtain a degree?)

(PLEASE CIRCLE ONE NUMBER)

Yes .... 1 ☛ *Please skip to question 11*
No 2

10. Does your institution offer a sufficient number and variety of courses to make it possible for students in at least some programs to complete an **entire** degree by enrolling **only** in courses taught at a distance?

(PLEASE CIRCLE ONE NUMBER)

Yes 1
No 2

11. **Over the next 3 years**, do you think that the number of **technology-based distance education** courses offered by your institution is likely to increase, stay the same, or decrease?

(PLEASE CIRCLE ONE NUMBER)

Increase	Stay the Same	Decrease	Have No Idea
1	2	3	9

12. To your knowledge, about what percentage of **faculty** used each of the following in any of their courses **during the 1993 Fall Term?**

- ☛ ***All questions about faculty refer to full-time regular faculty, as defined by your institution.***
- ☛ ***Please do not include use of these technologies in courses that were offered only as distance education courses.***

*(PLEASE CIRCLE **YOUR BEST ESTIMATE FOR EACH ITEM**)*

	PERCENTAGE OF FACULTY WHO USED EACH LISTED TECHNOLOGY DURING THE 1993 FALL TERM:					
	None	Fewer Than 10%	10% to 25%	26% to 50%	More Than 50%	Have No Idea
a. Computers	0	1	2	3	4	9
b. Audio technologies	0	1	2	3	4	9
c. Video technologies	0	1	2	3	4	9
d. Multimedia technologies	0	1	2	3	4	9

13. To your knowledge, have any of your institution's faculty developed audio, video, and/or multimedia instructional materials within the past 12 months?

*(PLEASE CIRCLE **ONE NUMBER**)*

Yes..1
No...2 ☛ *Please skip to question 15*

14. Which of the following incentives, if any, does your institution usually provide to faculty who develop audio, video, and/or multimedia instructional materials?

*(PLEASE CIRCLE **ALL THAT APPLY**)*

Faculty share in royalties.. 1
Faculty retain rights to applications/programs they develop 2
Reduced course load 3
Grants to directly support the development of instructional materials......... 4
Assistance in obtaining outside grants or contracts for the development of instructional materials... 5
Technical production assistance 6
Clerical/logistical support.. 7
Additional compensation from the institution... 8
Credit toward promotion/tenure... 9
Other incentives...10
No incentives.. 0

15. To your knowledge, are any on-campus classes that are conducted by your faculty audiotaped or videotaped ?

*(PLEASE CIRCLE **ONE NUMBER**)*

Yes..1
No...2 ☛ *Please skip to question 17*

16. Which **one** of the following **best** describes your institution's policy regarding the use or re-purposing of audiotapes or videotapes of classes conducted by your faculty?
(PLEASE CIRCLE ONE NUMBER)

The institution retains all rights to these tapes	1
The institution retains all rights but distributes royalties	2
Rights are shared with the taped faculty member(s)	3
Faculty who are taped retain all rights	4
Policy varies by situation and/or faculty member	5
The institution has no policy on this issue	0

17. To your knowledge, does your institution use computer modeling/forecasting techniques to predict student demand for specific courses?
(PLEASE CIRCLE ONE NUMBER)

Yes	1
No	2

18. Who is providing **leadership or direction** at your institution in each of the following areas?
*(PLEASE CIRCLE **ALL THAT APPLY** FOR EACH AREA)*

	Doesn't Apply: This Is Not Done Here	Academic Computing Staff	Library Staff	Media Resources Staff	Academic Administrators (e.g., Deans)	Individual Faculty/ Academic Department(s)	Other
a. Integration of technology into teaching	0	1	2	3	4	5	6
b. Acquisition and distribution of audio, video, & multimedia equipment	0	1	2	3	4	5	6
c. Acquisition & distribution of microcomputers & workstations	0	1	2	3	4	5	6
d. Production of audio, video, & multimedia instructional materials	0	1	2	3	4	5	6
e. Development of campus network systems	0	1	2	3	4	5	6
f. Access to Internet/Bitnet	0	1	2	3	4	5	6
g. Access to online and/or CD ROM databases	0	1	2	3	4	5	6

19. **In your opinion, how much potential does each of the following technologies have to help meet your institution's instructional mission?**
*(PLEASE CIRCLE **ONE** NUMBER FOR EACH ITEM)*

	None	Some	A Great Deal	Have No Idea
a. Distance education	1	2	3	9
b. Computer networks	1	2	3	9
c. Classroom uses of audio, video, and multimedia technologies	1	2	3	9
d. Electronic publishing (that is, the public issuance of documents in an electronic format)	1	2	3	9

20. In your opinion, how much **potential** does each of the following technologies have to help meet your institution's **community service mission?**
*(PLEASE CIRCLE **ONE** NUMBER FOR EACH ITEM)*

Doesn't apply: This institution has no appreciable community service mission...... 0

	None	Some	A Great Deal	Have No Idea
a. Distance education	1	2	3	9
b. Computer networks	1	2	3	9
c. Classroom uses of audio, video, and multimedia technologies	1	2	3	9
d. Electronic publishing (that is, the public issuance of documents in an electronic format)	1	2	3	9

21. **Over the next 3 years,** do you think that each of the following is likely to increase, stay the same, or decrease with regard to **on-campus courses** at your institution?

☛ *By "on-campus courses," we mean courses that are **not** exclusively distance education courses.*

*(PLEASE CIRCLE **ONE** NUMBER FOR EACH ITEM)*

	Increase	Stay the Same	Decrease	Have No Idea
a. Number of faculty who use **audio** technologies for on-campus instructional purposes	1	2	3	9
b. Number of faculty who use **video** technologies for on-campus instructional purposes	1	2	3	9
c. Number of faculty who use **multimedia** technologies for on-campus instructional purposes	1	2	3	9
d. Number of faculty who use **computers** for on-campus instructional purposes	1	2	3	9

22. **Over the next 3 years,** do you think that your **institution's expenditures** for each of the following are likely to increase, stay the same, or decrease?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Doesn't Apply: Not a Current or Likely Future Area of Expenditures	Increase	Stay the Same	Decrease	Have No Idea
a. Super-computers, mainframes, and minis	0	1	2	3	9
b. Microcomputers and workstations	0	1	2	3	9
c. Audio equipment	0	1	2	3	9
d. Video equipment	0	1	2	3	9
e. Multimedia equipment	0	1	2	3	9
f. Video production (production of live or taped telecourses, etc.)	0	1	2	3	9
g. Training of faculty/students in use of instructional technologies	0	1	2	3	9
h. Instructional-technologies technical support	0	1	2	3	9

23. **Over the next 3 years,** are most of your institution's purchases of each of the following likely to be replacements/upgrading of existing equipment or purchases of additional equipment?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Doesn't Apply: No Likely Purchases of This Type	Mostly Will Replace or Upgrade	Mostly Will Purchase Additional Equipment	Will Do About the Same Amount of Replacements and Additional Equipment	Have No Idea
a. Super-computers, mainframes, and minis	0	1	2	3	9
b. Microcomputers and workstations	0	1	2	3	9
c. Audio equipment	0	1	2	3	9
d. Video equipment	0	1	2	3	9
e. Multimedia equipment	0	1	2	3	9

24. **Over the next 3 years,** do you think that your institution's **funding for instructional technologies** from each of the listed sources is likely to increase, stay the same, or decrease?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Doesn't Apply: Not a Current or Likely Future Source of Funds	Increase	Stay the Same	Decrease	Have No Idea
a. General operating funds of the institution	0	1	2	3	9
b. Internally generated funds (e.g., licensing of institutionally-produced software)	0	1	2	3	9
c. Student/faculty fees for use of computers and other instructional technologies	0	1	2	3	9
d. Special state appropriations	0	1	2	3	9
e. Business, industry, and foundation contracts and grants	0	1	2	3	9
f. Federal contracts and grants	0	1	2	3	9
g. Donations and gifts	0	1	2	3	9

25. In your opinion, to what extent, if at all, have computers and other instructional technologies **benefited** each of the following?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Doesn't Apply	Not At All	Not Very Much	A Moderate Amount	A Great Deal	Have No Idea
a. The quality of **undergraduate** education at your institution	0	1	2	3	4	9
b. The quality of **graduate** education at your institution	0	1	2	3	4	9
c. The way faculty at your institution teach their classes	xx	1	2	3	4	9
d. Faculty productivity as teachers	xx	1	2	3	4	9
e. Faculty productivity as scholars or researchers	xx	1	2	3	4	9

26. In your opinion, how much of an impediment is each of the following to the increased use of instructional technologies in your institution?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Not An Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
a. Insufficient funds	1	2	3	4	9
b. Lack of top administrators' interest in expanded use of instructional technologies	1	2	3	4	9
c. Lack of faculty interest in expanded use of instructional technologies	1	2	3	4	9
d. Lack of incentives/rewards to faculty for using instructional technologies	1	2	3	4	9
e. Lack of strategic planning	1	2	3	4	9
f. Lack of appropriate organizational structures	1	2	3	4	9
g. Lack of appropriate instructional software	1	2	3	4	9
h. Lack of appropriate equipment	1	2	3	4	9
i. Lack of space	1	2	3	4	9
j. Lack of infrastructure (e.g., cabling)	1	2	3	4	9
k. Faculty technophobia	1	2	3	4	9
l. Student technophobia	1	2	3	4	9
m. Inadequate faculty technical/ computer skills	1	2	3	4	9
n. Inadequate student technical/ computer skills	1	2	3	4	9
o. Lack of staff who can provide training in instructional technologies	1	2	3	4	9
p. Lack of skilled technical staff	1	2	3	4	9
q. Copyright issues	1	2	3	4	9

27. In your opinion, how well has your institution accomplished the following?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Not At All	Not Very Well	Moderately Well	Very Well	Have No Idea
a. Developed clear plans for the use of instructional technology	1	2	3	4	9
b. Met **faculty** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	1	2	3	4	9
c. Met **student** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	1	2	3	4	9
d. Provided incentives and rewards to faculty for integrating instructional technology into the classroom	1	2	3	4	9
e. Used instructional technologies to improve the overall quality of education at your institution	1	2	3	4	9
f. Used communications technologies (such as e-mail, networking, etc.) to increase the frequency, convenience, and/or quality of **student-faculty** interactions	1	2	3	4	9
g. Addressed issues of student access to computers, data bases, and networks	1	2	3	4	9
h. Addressed issues of confidentiality and privacy related to technology use (computers, data bases, and networks)	1	2	3	4	9

Thank you very much for your participation.

Please return this completed questionnaire in the enclosed business-reply envelope to:
SRI International, Survey Research Program, Menlo Park, CA 94025-3493

CORPORATION FOR PUBLIC BROADCASTING
A Quarter Century of Quality Programming

901 E Street, NW
Washington, DC 20004-2037
(202) 879-9600

Computer Questionnaire

Spring, 1994

Dear Colleague:

The Corporation for Public Broadcasting (CPB) is conducting a comprehensive, multi-faceted national survey of 1,000 higher education institutions on the instructional uses of communications technology, including audio, video, multimedia, and computers. (CPB is a private, non-profit corporation created by Congress in 1967 to oversee the growth of public radio and television in the United States.) This study will help us plan for the future of public telecommunications, and it will help educators, policymakers, and funders and producers of educational programming develop better and more effective products.

The study includes six institutional-level questionnaires designed to assess:

- Availability and ways in which computers are used for instructional purposes.
- Use of audio, video, and multimedia technologies in the classroom.
- Use of audio, video, multimedia, and computer technologies in teacher education.
- Use of computer technologies in the libraries.
- Use of distance education technologies.
- Institutional policies and chief academic officers' perceptions of current and future use of instructional technologies.

Two additional questionnaires will assess faculty and student experiences and opinions about computers and other instructional technologies.

This questionnaire concerns the availability and ways in which computers are used for instructional purposes at your institution. Either you personally or another representative of your institution has informed us that you are the person most knowledgeable about these issues. *Your participation is very important to the overall accuracy of the survey results.* Your responses will be held strictly confidential.

In appreciation for your participation, we will provide the chief academic officer at your institution with a summary report of the study results. In addition, we will be pleased to work with you or another representative of your institution to provide a customized analysis of the study data.

Please complete this questionnaire as soon as possible and return it in the enclosed business-reply envelope. CPB has engaged SRI International (formerly Stanford Research Institute) to conduct this study. If you have any questions, please contact SRI project director Dr. Susan Russell, at 415/859-4164, or CPB project coordinator Ms. Wendy Charlton, at 202/879-9672.

Thank you in advance for your cooperation.

Sincerely,

Robert T. Coonrod
Executive Vice President

This study is endorsed by:

American Association of Colleges for Teacher Education

American Association of Community and Junior Colleges

American Association for Higher Education

American Association of State Colleges and Universities

Association of American Colleges

CAUSE (Association for Information Technology Managers)

Council of Independent Colleges

Educom

National Association of State Universities and Land-Grant Colleges

National University Continuing Education Association

BEST COPY AVAILABLE

1994 STUDY OF COMMUNICATIONS TECHNOLOGY IN HIGHER EDUCATION

Instructional Uses of Computers

- Questions about faculty refer to **full-time regular faculty**, as defined by your institution.
- Questions about students refer to **full-time and part-time students taking courses for credit** at your institution.

AVAILABILITY AND USE OF COMPUTER HARDWARE AND SOFTWARE

1. Which of the following does your institution have available to at least some faculty and students for instruction-related purposes (either in or outside the classroom)?
*(PLEASE CIRCLE **ALL THAT APPLY** IN EACH COLUMN)*

	INSTITUTION HAS THESE AVAILABLE FOR INSTRUCTION-RELATED PURPOSES:	
	To Faculty	**To Students**
Supercomputers, mainframes, and/or minicomputers	1	1
Microcomputers (PCs, Macs) and/or workstations (Suns, NeXTs, etc.) with **hard-wired connections** to the institution's supercomputer, mainframe, or minicomputer, or to other microcomputers	2	2
Microcomputers (PCs, Macs) and/or workstations (Suns, NeXTs, etc.) with **dialup access** to the institution's supercomputer, mainframe, or minicomputer	3	3
Stand-alone microcomputers (PCs, Macs) and/or workstations (Suns, NeXTs, etc.) **without hard-wired connections or dialup access** to other computers	4	4

2. For what percentage of your institution's faculty does your institution provide a microcomputer or workstation for their sole use?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

- *By "faculty," we mean **full-time regular faculty**.*

None	Fewer than 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
0	1	2	3	4	5	9

3. What percentage of your institution's students have access when needed to a microcomputer or workstation (either their own or one provided by the institution) for use outside the classroom?
(PLEASE CIRCLE YOUR BEST ESTIMATE)

☛ ***By "students," we mean full-time and part-time students taking courses for credit at your institution.***

Fewer than 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
1	2	3	4	5	9

4. What percentage of your institution's faculty and students would you estimate **use computers more than once a week** for instructional or research purposes?
(PLEASE CIRCLE YOUR BEST ESTIMATE FOR EACH GROUP)

	Fewer than 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
a. Faculty	1	2	3	4	5	9
b. Students	1	2	3	4	5	9

5. How, if at all, are students charged for use of the institution's computers?
(PLEASE CIRCLE ALL THAT APPLY IN EACH COLUMN)

	Use of Supercomputers, Mainframes or Minis	Use of Microcomputers or Workstations
Doesn't apply: Students do not have access to institutionally-owned computers of these types	0	0
Charges are included in student fees	1	1
Charges are included in specific course fees	2	2
Charges are by length and/or type of use (hourly charges; printing charges, etc.)	3	3
Charges are made against fixed-dollar-amount accounts established by students	4	4
Other charging mechanism	5	5
Students are not charged for using these types of computers (other than through tuition)	6	6

6. For which of the following kinds of computer use, if any, are faculty charged?
(PLEASE CIRCLE ALL THAT APPLY IN EACH COLUMN)

	Use of Supercomputers, Mainframes or Minis	Use of Microcomputers or Workstations
Doesn't apply: Faculty do not have access to institutionally-owned computers of these types	0	0
Funded research	1	1
Non-funded research	2	2
Instruction	3	3
Personal use	4	4
Faculty are not charged for any of the above kinds of computer use	5	5

7. Are open-access microcomputers or workstations provided by your institution for student use outside the classroom?

☛ ***By "open-access," we mean available for student use most of the time.***

*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No .... 2 ☛ *Please skip to question 10*

8. In which of the following locations are these open-access microcomputers or workstations located? *(PLEASE CIRCLE **ALL THAT APPLY**)*

Dorms/residences 1
Library(ies) 2
Academic department(s) 3
Student center 4
Computer center 5
Other location(s) 6

9. What is the approximate ratio of students to **open-access** microcomputers or workstations at your institution?

☛ ***By "students," we mean full-time and part-time students taking courses for credit at your institution.***

*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

10 or fewer students to 1 machine 1
11-25 students to 1 machine 2
26-50 students to 1 machine 3
51-100 students to 1 machine 4
101-200 students to 1 machine 5
More than 200 students to 1 machine 6
Have no idea 9

10. Does your institution have any rooms in which classes can meet that have computers for individual student use (e.g., computer labs that are sometimes used as classrooms)? *(PLEASE CIRCLE **ONE** NUMBER AND ENTER YOUR **BEST ESTIMATE**, IF APPLICABLE)*

Yes .... 1 ☛ Total number of student-use computers in these rooms: ________
No 2

11. **To your knowledge**, for which of the following kinds of microcomputer software does your institution have a site license for faculty and student use?
*(PLEASE CIRCLE **ALL THAT APPLY IN EACH COLUMN**)*

	Site License for Faculty Use	**Site License for Student Use**
Word processing (Word Perfect, Word, etc.)	1	1
Spreadsheets or other business applications (Lotus, Excel, etc.)	2	2
Database packages (dBase, Paradox, etc.)	3	3
Statistical analysis packages (Minitab, SPSS, SAS, Systat, etc.)	4	4
Communications (ProComm, Crosstalk, Telemate, etc.)	5	5
Desk-top publishing packages (PageMaker, QuarkXPress, FrameMaker, etc.)	6	6
Authoring tools (HyperCard, Toolbook, Linkway, etc.)	7	7
Presentation programs (Powerpoint, Persuasion, etc.)	8	8
Engineering software (e.g., computer-assisted design)	9	9
Instructional software designed to teach specific subject matter	10	10
None of the above	0	0

12. Does your institution charge faculty or students for any software use (for example, software that was developed internally or for which you have a site license)?
*(PLEASE CIRCLE **ONE NUMBER ON EACH LINE**)*

	Doesn't Apply: The Institution Doesn't Provide Any Software for This Group	**Yes**	**No**	**Have No Idea**
a. Faculty	0	1	2	9
b. Students	0	1	2	9

13. To your knowledge, in which of the following areas, if any, does your institution offer courses, formal training or informal support/assistance to **students**, and in which areas is training required of **all** students?
*(PLEASE CIRCLE **ALL THAT APPLY** IN EACH COLUMN)*

	Offered:		
Offered to or Required of Students:	**Courses or Formal Training**	**Informal Support or Assistance**	**Courses or Training Required of ALL Students**
Orientation to the campus computer environment	1	1	1
Use of operating systems (DOS, UNIX, VMS, CMS, etc.) or graphical user interfaces (e.g., Windows)	2	2	2
Use of specific applications software	3	3	3
Use of programming languages (Pascal, C, etc.)	4	4	4
None of the above	0	0	0

COMPUTER-INTEGRATED MULTIMEDIA WORKSTATIONS AND COURSEWARE

14. Does your institution have any workstations that are used (entirely or in part) for self-paced individualized multimedia instruction?

*(PLEASE CIRCLE **ONE** NUMBER AND PROVIDE YOUR **BEST ESTIMATE**, IF APPLICABLE)*

Yes..1 ☛ About how many? ____________
No..2
Have no idea............................9
Please skip to question 18

15. **During the 1993 Fall Term,** did your institution offer any **on-campus** courses in which the instruction was delivered **primarily** through computer-integrated multimedia courseware?

☛ *By "on-campus courses," we mean courses that are not exclusively distance education courses.*

*(PLEASE CIRCLE **ONE** NUMBER)*

Yes..1
No..2
Have no idea............................9
Please skip to question 18

16. To your knowledge, about how many on-campus courses were offered by your institution **during the 1993 Fall Term** that **originated at this institution** and that were delivered primarily through computer-integrated multimedia courseware?

*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

None	1 to 5	6 to 10	More than 10	Have No Idea
0	1	2	3	9

17. To your knowledge, about how many on-campus courses were offered by your institution **during the 1993 Fall Term** that **originated outside this institution** and that were delivered primarily through computer-integrated multimedia courseware?

*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

None	1 to 5	6 to 10	More than 10	Have No Idea
0	1	2	3	9

CAMPUS COMPUTER NETWORKS

18. Does your institution have a campus network that provides for a hard-wired connection among microcomputers throughout your institution? (The network may or may not include one or more mainframes.)

*(PLEASE CIRCLE **ONE** NUMBER)*

Yes...1
No... 2
No, but we plan to have one within the next 3 years.....3
Please skip to question 25

19. About what percentage of each of the following are **hard-wired** to the campus computer network?

*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR EACH ITEM)*

	None	1% to 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
a. Faculty offices	0	1	2	3	4	5	9
b. Classrooms and student labs	0	1	2	3	4	5	9
c. Residence halls	0	1	2	3	4	5	9
d. Libraries	0	1	2	3	4	5	9

20. Does your institution transmit video over the campus computer network?
(PLEASE CIRCLE ONE NUMBER)

Yes	1
No	2
No, but we plan to do so within the next 3 years	3

21. Which of the following services are available on the campus computer network?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Electronic mail	1
Electronic conferencing	2
Access to campus mainframe(s)	3
File server	4
Voice mail	5
Bulletin board(s)	6
Access to Internet and/or Bitnet	7
Access to UseNet and/or FidoNet	8
Gateway access from the network to other locations	9
Dialup access to the network from off campus	10
Interactive student services, such as course registration, financial aid paperwork, etc	11

22. About what percentage of students have e-mail accounts?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

None	1% to 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
0	1	2	3	4	5	9

23. Does your institution extend the campus computer network to any off-campus locations (such as faculty, staff, or student residences, related institutions, etc.) by **hard-wired** dedicated lines?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes	1
No	2

TELEPHONE AND VOICE MAIL SYSTEMS

24. Is most or all of your institution's telephone system integrated with the campus computer network?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes	1
No	2

25. In about what percentage of each of the following have telephone lines been installed?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR **EACH** TYPE OF LOCATION)*

	None	1% to 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
a. Faculty offices	0	1	2	3	4	5	9
b. Classrooms and student labs	0	1	2	3	4	5	9

26. Does your institution have a voice mail system for all or parts of the campus?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes...1
No...2 } *Please skip to question 28*
No, but we plan to have one within the next 3 years.....3 } *Please skip to question 28*

27. About what percentage of the full-time regular faculty have voice mail boxes?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

None	1% to 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
0	1	2	3	4	5	9

28. Does your institution provide any on-campus dormitories or other on-campus residences for students?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes...1
No...2 ☛ *Please skip to question 31*

29. In about what percentage of institutionally owned student dormitory/residence **rooms** have telephone lines been installed?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

None	1% to 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
0	1	2	3	4	5	9

30. About what percentage of students in institutionally owned student dormitories/residences have voice mail boxes?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

None	1% to 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
0	1	2	3	4	5	9

COMMUNITY COMPUTER NETWORKS

31. Does your institution operate or participate with other organizations in operating a community computer network for local (K-12) schools, community organizations, etc.?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes...1
No...2 } *Please skip to question 31*
No, but we plan to develop a community network within the next 3 years...3 } *Please skip to question 31*

32. As far as you know, which of the following services are available on the community computer network?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Electronic mail	1
Electronic conferencing	2
Access to campus mainframe(s)	3
File server	4
Bulletin board(s)	5
Access to Internet and/or Bitnet e-mail	6
Access to other Internet/Bitnet services	7
Access to UseNet and/or FidoNet	8
Dialout to other local bulletin board services	9
Access to the campus network	10

33. Which of the following does your institution provide to the community computer network?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Use of hardware (e.g., host computer)	1
Dedicated-line access to Internet or Bitnet	2
Technical or administrative support	3
Funding	4
Training in network use	5
None of the above	0

INTERNET/BITNET

34. How does your institution provide access to Internet and Bitnet, if at all?
*(PLEASE CIRCLE **ONE** NUMBER IN **EACH** COLUMN)*

	Internet	Bitnet
The institution does **not** provide access now, and we have no plans to do so within the next 3 years	0	0
The institution does **not** provide access now, but we plan to do so within the next 3 years	1	1
The institution is a node (that is, it maintains a dedicated line to the network)	2	2
Access is provided through a commercial party (e.g., CompuServe)	3	3
Access is provided through another higher education institution, government entity, or other noncommercial institution	4	4

☛ *If no current access to __either__ network, please skip to question 45, page 11*

☛ *If no current access to __either__ network, please skip to question 45, page 11*

35. To which of the following Internet/Bitnet services, if any, do most **faculty** have access?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Most faculty do **not** have access to the Internet or Bitnet........ 0 ☛ *Please skip to question 38*
Internet or Bitnet address/e-mail 1
File Transfer Protocol (FTP) 2
Terminal emulation/virtual terminal facility (e.g., Telnet) 3
UseNet news groups 4
All services 5

36. Is training in Internet or Bitnet access/use offered to or required of faculty?
*(PLEASE CIRCLE **ONE** NUMBER)*

Training is required............................... 1
Training is offered but not required...... 2
Training is not offered............................3

37. For which of the following kinds of Internet or Bitnet use are faculty charged?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Funded research..................................... 1
Non-funded research............................... 2
Instruction..3
Personal use 4
All services 5
Faculty are not charged for any of the
above kinds of Internet/Bitnet use............0

38. To which of the following Internet or Bitnet services, if any, do most **students** have access?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Most students do **not** have access to the Internet or Bitnet.... 0 ☛ *Please skip to question 42*
Internet or Bitnet address/e-mail 1
File Transfer Protocol (FTP) 2
Terminal emulation/virtual terminal facility (e.g., Telnet) 3
UseNet news groups 4
All services 5

39. Is training in Internet or Bitnet access/use offered to or required of students?
*(PLEASE CIRCLE **ONE** NUMBER)*

Training is required............................... 1
Training is offered but not required...... 2
Training is not offered............................3

40. **Does your institution place any restrictions on students' personal use of the Internet/Bitnet?**
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes..1
No...2

41. **How, if at all, are students charged for use of the Internet/Bitnet?**
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Charges are included in student fees........................ 1
Charges are included in specific course fees........... 2
Charges are by length and/or type of use
(hourly charges; printing charges, etc.)..................... 3
Other charging mechanism....................................... 4
Students are not charged for Internet/Bitnet use...... 5

42. **In which of the following ways, if at all, is it possible for at least some Internet/Bitnet users outside your institution** (for example, researchers or students from other institutions, the public, etc.) to access your institution's computing resources, data bases, etc.?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Doesn't apply: Don't provide any access to outside users........... 0
Read-only access to online library card catalog(s)......................... 1
Read-only access to other public access data bases/text files..... 2
File transfer (FTP) access to data bases/text files......................... 3
Read/write/download access to bulletin boards.............................. 4
Telnet access to high capacity processors...................................... 5
Telnet access to communication servers.. 6
Other type(s) of access.. 7

43. Does your institution make available indexes of its information resources for users to access via search tools such as Gopher, Archie, WhoIs, Finger, etc.?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes..1
No...2

44. Does your institution maintain any mailing lists (for example of special interest groups) for Internet or Bitnet users?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes..1
No...2

INSTITUTIONAL POLICIES AND PLANS

45. **Over the next 3 years,** do you think that your institution's expenditures for each of the following are likely to increase, remain the same, or decrease?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Doesn't Apply: Not a Current or Likely Future Area of Expenditures	Increase	Stay the Same	Decrease	Have No Idea
a. Internet/Bitnet infrastructure	0	1	2	3	9
b. Internet/Bitnet technical support and training	0	1	2	3	9
c. Campus network infrastructure	0	1	2	3	9
d. Campus network technical support and training	0	1	2	3	9
e. **Community** network infrastructure	0	1	2	3	9
f. **Community** network technical support and training	0	1	2	3	9
g. Super-computers, mainframes, and minis	0	1	2	3	9
h. Microcomputers and workstations	0	1	2	3	9
i. Computer software	0	1	2	3	9
j. Computer-related training of faculty/students	0	1	2	3	9
k. Computer-resources technical support	0	1	2	3	9

46. **Over the next 3 years,** are most of your institution's purchases of each of the following likely to be replacements/upgrading of existing equipment or purchases of additional equipment?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Doesn't Apply: No Likely Purchases of This Type	Mostly Will Replace or Upgrade	Mostly Will Purchase Additional Equipment	Will Do About the Same Amount of Replacements and Additional Equipment	Have No Idea
a. Super-computers, mainframes, and minis	0	1	2	3	9
b. Microcomputers and workstations	0	1	2	3	9
c. Computer software	0	1	2	3	9

47. **Over the next 3 years,** do you think that funding at your institution for instructional use of computers from each of the listed sources is likely to increase, remain the same, or decrease?
(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	Doesn't Apply: Not a Current or Likely Future Source of Funds	Increase	Stay the Same	Decrease	Have No Idea
a. General operating funds of the institution	0	1	2	3	9
b. Internally generated funds (e.g., licensing of institutionally-produced software)	0	1	2	3	9
c. Student/faculty fees for computer use	0	1	2	3	9
d. Special state appropriations	0	1	2	3	9
e. Business, industry, and foundation contracts and grants	0	1	2	3	9
f. Federal contracts and grants	0	1	2	3	9
g. Donations and gifts	0	1	2	3	9

48. How much of an impediment do you think each of the following is to the increased use of computers for instructional purposes in your institution?
(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	Not An Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
a. Insufficient funds	1	2	3	4	9
b. Lack of top administrators' interest in expanded instructional uses of computers	1	2	3	4	9
c. Lack of faculty interest in expanded instructional uses of computers	1	2	3	4	9
d. Lack of incentives/rewards to faculty for instructional uses of computers	1	2	3	4	9
e. Lack of strategic planning	1	2	3	4	9
f. Lack of appropriate organizational structures	1	2	3	4	9
g. Lack of appropriate instructional software	1	2	3	4	9
h. Lack of appropriate hardware	1	2	3	4	9
i. Lack of space	1	2	3	4	9
j. Inadequate infrastructure (e.g., cabling, power outlets, etc.)	1	2	3	4	9
k. Lack of common user interfaces	1	2	3	4	9
l. Faculty technophobia	1	2	3	4	9
m. Student technophobia	1	2	3	4	9
n. Inadequate faculty computer skills	1	2	3	4	9
o. Inadequate student computer skills	1	2	3	4	9
p. Lack of staff who can provide training in instructional uses of computers	1	2	3	4	9

49. In your opinion, how well has your institution accomplished the following?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Not At All	Not Very Well	Moderately Well	Very Well	Have No Idea
a. Developed clear plans for the use of instructional technology	1	2	3	4	9
b. Met **faculty** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	1	2	3	4	9
c. Met **student** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	1	2	3	4	9
d. Provided incentives and rewards to faculty for integrating instructional technology into the classroom	1	2	3	4	9
e. Used instructional technologies to improve the overall quality of education at your institution	1	2	3	4	9
f. Used communications technologies (such as e-mail, networking, etc.) to increase the frequency, convenience, and/or quality of **student-faculty** interactions	1	2	3	4	9
g. Addressed issues of student access to computers, data bases, and networks	1	2	3	4	9
h. Addressed issues of confidentiality and privacy related to technology use (computers, data bases, and networks)	1	2	3	4	9

Thank you very much for your participation.

Please return this completed questionnaire in the enclosed business-reply envelope to:
SRI International, Survey Research Program, Menlo Park, CA 94025-3493

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A Quarter Century of Quality Programming

901 E Street, NW
Washington, DC 20004-2037
(202) 879-9600

Instructional Technologies Questionnaire

This study is endorsed by:

American Association of Colleges for Teacher Education

American Association of Community and Junior Colleges

American Association for Higher Education

American Association of State Colleges and Universities

Association of American Colleges

CAUSE (Association for Information Technology Managers)

Council of Independent Colleges

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National Association of State Universities and Land-Grant Colleges

National University Continuing Education Association

Spring, 1994

Dear Colleague:

The Corporation for Public Broadcasting (CPB) is conducting a comprehensive, multi-faceted national survey of 1,000 higher education institutions on the instructional uses of communications technology, including audio, video, multimedia, and computers. (CPB is a private, non-profit corporation created by Congress in 1967 to oversee the growth of public radio and television in the United States.) This study will help us plan for the future of public telecommunications, and it will help educators, policymakers, and funders and producers of educational programming develop better and more effective products.

The study includes six institutional-level questionnaires designed to assess:

- Use of audio, video, and multimedia technologies in the classroom.
- Availability and ways in which computers are used for instructional purposes.
- Use of audio, video, multimedia, and computer technologies in teacher education.
- Use of computer technologies in the libraries.
- Use of distance education technologies.
- Institutional policies and chief academic officers' perceptions of current and future use of instructional technologies.

Two additional questionnaires will assess faculty and student experiences and opinions about computers and other instructional technologies.

This questionnaire concerns the use of audio, video, and multimedia technologies in the classroom at your institution. Either you personally or another representative of your institution has informed us that you are the person most knowledgeable about these issues. *Your participation is very important to the overall accuracy of the survey results.* Your responses will be held strictly confidential.

In appreciation for your participation, we will provide the chief academic officer at your institution with a summary report of the study results. In addition, we will be pleased to work with you or another representative of your institution to provide a customized analysis of the study data.

Please complete this questionnaire as soon as possible and return it in the enclosed business-reply envelope. CPB has engaged SRI International (formerly Stanford Research Institute) to conduct this study. If you have any questions, please contact SRI project director Dr. Susan Russell, at 415/859-4164, or CPB project coordinator Ms. Wendy Charlton, at 202/879-9672.

Thank you in advance for your cooperation.

Sincerely,

Robert T. Coonrod
Executive Vice President

1994 STUDY OF COMMUNICATIONS TECHNOLOGY IN HIGHER EDUCATION

Instructional Technologies Questionnaire

☛ This questionnaire is concerned with the following kinds of instructional technologies (that is, technologies used to teach and/or enable student learning):

Video technologies (carry picture and sound): Broadcast, cable, or closed-circuit television; compressed video; videocassettes; videodiscs; video projection systems.

Audio technologies (carry sound only): audio cassettes, audiotapes, audio CDs, records, radio.

Multimedia: Computer-mediated integration of text, audio, and/or video technologies --for example, microcomputers linked to and controlling videodisc players, CD ROMs, video/audio projection units, or slide or video digitizers.

☛ This questionnaire is concerned mostly with **on-campus courses--that is, those that are not taught exclusively as distance education courses.** (By "distance education," we mean the delivery of instruction to students, most of whom are located at a remote off-campus site or sites, physically removed from the instructor.)

☛ Most questions about **distance education** and the use of **computers** for instructional purposes are covered in **other** questionnaires.

AUDIO, VIDEO, AND MULTIMEDIA INSTRUCTIONAL TECHNOLOGY FACILITIES AND EQUIPMENT

1. To your knowledge, which of the following equipment is maintained for faculty or student use at your institution?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Tape recorders	1
Slide projectors	2
Film projectors	3
Camcorders	4
VCRs	5
Audio compact disc (CD) players	6
CD ROM players/drivers	7
Multiscan video projectors (project a videotape or a computer-screen image onto a larger screen)	8
Other video projectors	9
LCD projection panels (used with overhead projectors to project a computer-screen image onto a larger screen)	10
Electronic blackboards	11
None of the above	0 ☛ *Please skip to question 4*

2. When **faculty** request equipment (circled in question 1), how often is it available for their use, for either check-out or on-site use?
*(PLEASE CIRCLE **ONE** NUMBER)*

Rarely	Sometimes	Usually	Almost Always	Have No Idea
1	2	3	4	9

3. When **students** request equipment (circled in question 1), how often is it available for their use, for either check-out or on-site use?
*(PLEASE CIRCLE **ONE** NUMBER)*

Most Equipment Is Not Available for Student Use	Rarely	Sometimes	Usually	Almost Always	Have No Idea
0	1	2	3	4	9

4. In what percentage of your institution's classrooms have each of the following been installed?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR **EACH** ITEM)*

Installed Equipment:	None	Fewer than 5%	5% to 10%	11% to 25%	26% to 50%	More than 50%	Have No Idea
a. Video monitor	0	1	2	3	4	5	9
b. VCR	0	1	2	3	4	5	9
c. Electronic blackboard	0	1	2	3	4	5	9
d. Film/slide projection screen	0	1	2	3	4	5	9
e. Film/slide projection booth	0	1	2	3	4	5	9
f. Sound amplification system	0	1	2	3	4	5	9
g. Cable television outlet	0	1	2	3	4	5	9
h. Closed circuit TV outlet (**not** for cable TV)	0	1	2	3	4	5	9

5. For each of the facilities/types of work stations listed below, please indicate whether your institution has each and, if so, the total number of student stations.
*(PLEASE CIRCLE **ONE** NUMBER IN **EACH** ROW AND ENTER YOUR **BEST ESTIMATES**, AS APPLICABLE)*

	Have This/These?			
	Yes	No	Have No Idea	Total Number of Student Stations:
a. Audiotape-based learning center or work stations, such as a language lab	1	2	9	________
b. Videotape-based learning center or work stations	1	2	9	________

6. Does your institution have any classrooms that are designed and equipped for origination of live video programs?
*(PLEASE CIRCLE **ONE** NUMBER AND ENTER YOUR **BEST ESTIMATE**, IF APPLICABLE)*

Yes..1 ☛ How many? __________

No..2

7. Does your institution have any classrooms that are specially designed to provide for the **computer-controlled integration of technologies** such as videodisc players, VCRs, and projection equipment? *(Do **not** include computer labs, language labs, or rooms with other kinds of individual work stations.)*
*(PLEASE CIRCLE **ONE** NUMBER AND ENTER YOUR **BEST ESTIMATE**, IF APPLICABLE)*

Yes.. 1 ☛ How many? ___________
No.. 2

8. Does your institution maintain a **centrally administered** collection(s) of audio, video, and/or multimedia software?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Yes, housed in the institution's library(ies)............... 1
Yes, housed in media resources center(s), etc........ 2
No.. 3 ☛ *Please skip to question 10*

9. To your knowledge, which of the following are available in any of your institution's centrally administered collection(s) for loan to students or for student use on-site?
*(PLEASE CIRCLE **ALL THAT APPLY** IN **EACH** COLUMN)*

	Available to Students for Loan	Available to Students for Use On-Site
Records, audio tapes, and/or audio CDs	1	1
Videotapes	2	2
Films	3	3
Microfiche or microfilm	4	4
Electronic materials that integrate text and visual images, such as a CD ROM-based encyclopedia	5	5
Other CD ROMs (text-only CDs, databases, etc.)	6	6
Other computer software	7	7
Video materials produced by public television (PBS Video, Annenberg/CPB Project telecourses, etc.)	8	8
Audio materials produced by National Public Radio (NPR) or American Public Radio (APR)	9	9

10. Which of the following kinds of satellite dishes, if any, does your institution currently have?
*(PLEASE CIRCLE **ALL THAT APPLY** AND ENTER YOUR **BEST ESTIMATES**, AS APPLICABLE)*

	(If Applicable) How Many?
None.. 0	
Dual C/Ku band... 1	_______
Fixed (non-rotatable) C-band...................... 2	_______
Rotatable C-band.. 3	_______
Fixed (non-rotatable) Ku-band.................... 4	_______
Rotatable Ku-band...................................... 5	_______
Very Small Aperture Terminal (VSAT)....... 6	_______
Other kind of satellite dish........................... 7	_______

11. Over the next 3 years, does your institution plan to increase its number of satellite dishes?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes.......................................1
No..2
Have no idea..........................9

12. Which of following central video reception equipment, if any, is currently available at your institution, and which is likely to be available three years from now?
*(PLEASE CIRCLE **ALL THAT APPLY IN EACH** COLUMN)*

	Available Now	Likely To Be Available Three Years From Now
Instructional Television Fixed Service (ITFS) reception equipment	1	1
"Wireless cable" reception equipment	2	2
Connection to fiber optic network (e.g., telephone company or state government broadband network)	3	3
None of the above	0	0

13. Does your institution provide any on-campus dormitories or other on-campus residences for students?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes.......................................1
No..2 ☛ *Please skip to question 15*

14. What percentage of institutionally owned dormitories/residences have cable television outlets?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

None	1% to 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
0	1	2	3	4	5	9

15. Does your institution operate a closed circuit video network or cable system within the institution?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes.......................................1
No..2

16. Which of the following, if any, does your institution have a license to operate?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Public/non-commercial television station.......................... 1
Commercial television station.. 2
Student-run non-commercial radio station......................... 3
Student-run commercial radio station................................ 4
Public/non-commercial radio station (**not** student-run)..... 5
Commercial radio station (**not** student-run)....................... 6
None of the above... 0

VIDEO COURSES

17. During the 1993 Fall Term, did your institution offer any **on-campus** courses in which the instruction was delivered **primarily** through videotape or live video feed?

☛ *By "on-campus courses," we mean courses that are not exclusively distance education courses.*

*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No .... 2 ☛ *Please skip to question 20*

VIDEO COURSES ORIGINATING AT THIS INSTITUTION

18. To your knowledge, about how many of each of the following types of on-campus courses offered by your institution during the 1993 Fall Term **originated at this institution** (e.g., taught by your faculty)?

*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR **EACH** ITEM)*

	None	1 to 5	6 to 10	More than 10	Have No Idea
a. Live video feed of an entire "regular" (on-campus) course	0	1	2	3	9
b. Pre-packaged videotape course involving relatively little production effort (for example, a videotaped recording of a lecture course)	0	1	2	3	9
c. Pre-packaged videotape course involving a significant investment in production (for example, involving narrated documentary, simulations, graphics, etc.)	0	1	2	3	9

VIDEO COURSES ORIGINATING OUTSIDE THIS INSTITUTION

19. To your knowledge, about how many of each of the following types of on-campus courses offered by your institution during the 1993 Fall Term **originated outside this institution**?

*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR **EACH** ITEM)*

	None	1 to 5	6 to 10	More than 10	Have No Idea
a. Live video feed of an entire "regular" (on-campus) course	0	1	2	3	9
b. Pre-packaged videotape course involving relatively little production effort (for example, a videotaped recording of a lecture course)	0	1	2	3	9
c. Pre-packaged videotape course involving a significant investment in production (for example, involving narrated documentary, simulations, graphics, etc.)	0	1	2	3	9

AUDIO, VIDEO, AND MULTIMEDIA PRODUCTION

20. To your knowledge, are any on-campus classes that are conducted by your faculty audiotaped or videotaped?

*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No .... 2 ☛ *Please skip to question 22*

21. For which of the following reasons are on-campus classes audiotaped or videotaped?
*(PLEASE CIRCLE **ALL THAT APPLY** IN **EACH** COLUMN)*

	Audiotapes	Videotapes
As an accommodation to students with disabilities	1	1
As an accommodation to students generally	2	2
For archival purposes	3	3
For faculty training or professional development	4	4
To provide without charge to other institutions/campuses	5	5
To sell to cable channel(s), other institutions, etc.	6	6

22. Does your institution have one or more **self-service** facilities for production or post-production of audio, video, and/or multimedia materials?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes.. 1
No... 2

23. Does your institution have one or more **professionally staffed** facilities for production or post-production of audio, video, and/or multimedia materials?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes.. 1
No... 2 ☛ *Please skip to question 26*

24. Were the following kinds of audio, video, and multimedia materials produced in your professionally staffed production facility **during the past 12 months**?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** TYPE OF AUDIO, VIDEO, AND MULTIMEDIA MATERIALS)*

	Audio Materials			Video Materials			Multimedia Materials		
	Yes	No	Have No Idea	Yes	No	Have No Idea	Yes	No	Have No Idea
a. Higher education instructional materials	1	2	9	1	2	9	1	2	9
b. Other instructional materials (other adult education, K-12, preschool, etc.)	1	2	9	1	2	9	1	2	9
c. Other materials	1	2	9	1	2	9	1	2	9

25. Were any audio, video, or multimedia materials produced in your professionally staffed facility for the following purposes **during the past 12 months**?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** TYPE OF AUDIO, VIDEO, AND MULTIMEDIA MATERIALS)*

	Audio Materials			Video Materials			Multimedia Materials		
	Yes	No	Have No Idea	Yes	No	Have No Idea	Yes	No	Have No Idea
a. For use by this institution only	1	2	9	1	2	9	1	2	9
b. For sale or distribution to other institutions, organizations, or individuals outside this institution	1	2	9	1	2	9	1	2	9

INSTITUTIONAL POLICIES AND PLANS

26. **Over the next 3 years,** do you think that each of the following is likely to increase, stay the same, or decrease at your institution?

*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Increase	Stay the Same	Decrease	Have No Idea
a. Number of on-campus courses that use **audio** technologies	1	2	3	9
b. Number of on-campus courses that use **video** technologies	1	2	3	9
c. Number of on-campus courses that use **multimedia** technologies	1	2	3	9
d. Number of on-campus courses in which **multimedia self-paced** learning packages are used	1	2	3	9

27. **Over the next 3 years,** do you think that your **institution's expenditures** for each of the following are likely to increase, stay the same, or decrease?

*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Doesn't Apply: Not a Current or Likely Future Area of Expenditures	Increase	Stay the Same	Decrease	Have No Idea
a. Purchase and maintenance of audio, video, and multimedia hardware **installed in classrooms**	0	1	2	3	9
b. Purchase and maintenance of audio, video, and multimedia hardware **available for loan to faculty or students**	0	1	2	3	9
c. Purchase and maintenance of audio, video, and multimedia hardware for **production facilities**	0	1	2	3	9
d. Purchase of audio, video, and multimedia **software**	0	1	2	3	9
e. Training of faculty or students in **production** of audio, video, and/or multimedia materials	0	1	2	3	9
f. Training of faculty or students in **use** of audio, video, and/or multimedia materials	0	1	2	3	9
g. Instructional-technologies technical support	0	1	2	3	9

28. **Over the next 3 years,** do you think that your institution's **funding** for audio, video, and multimedia instructional technologies from each of the listed sources is likely to increase, stay the same, or decrease?

*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Doesn't Apply: Not a Current or Likely Future Source of Funds	Increase	Stay the Same	Decrease	Have No Idea
a. General operating funds of the institution	0	1	2	3	9
b. Internally generated funds (e.g., licensing of institutionally-produced software)	0	1	2	3	9
c. Student/faculty fees for use of computers and other instructional technologies	0	1	2	3	9
d. Special state appropriations	0	1	2	3	9
e. Business, industry, and foundation contracts and grants	0	1	2	3	9
f. Federal contracts and grants	0	1	2	3	9
g. Donations and gifts	0	1	2	3	9

29. In your opinion, how much of an impediment is each of the following to the increased use of audio, video, and multimedia instructional technologies in your institution?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Not An Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
a. Insufficient funds	1	2	3	4	9
b. Lack of top administrators' interest in expanded use of instructional technologies	1	2	3	4	9
c. Lack of faculty interest in expanded use of instructional technologies	1	2	3	4	9
d. Lack of incentives/rewards to faculty for using instructional technologies	1	2	3	4	9
e. Lack of strategic planning	1	2	3	4	9
f. Lack of appropriate organizational structures	1	2	3	4	9
g. Lack of appropriate instructional software	1	2	3	4	9
h. Lack of appropriate equipment	1	2	3	4	9
i. Lack of space	1	2	3	4	9
j. Lack of infrastructure (cabling, power outlets, etc.)	1	2	3	4	9
k. Faculty technophobia	1	2	3	4	9
l. Student technophobia	1	2	3	4	9
m. Inadequate faculty technical skills	1	2	3	4	9
n. Inadequate student technical skills	1	2	3	4	9
o. Lack of staff who can provide training in instructional technologies	1	2	3	4	9
p. Copyright issues	1	2	3	4	9

30. In your opinion, how well has your institution accomplished the following?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Not At All	Not Very Well	Moderately Well	Very Well	Have No Idea
a. Developed clear plans for the use of audio, video, and multimedia instructional technology	1	2	3	4	9
b. Met **faculty** needs regarding equipment, technical support, and training for the use of instructional technologies	1	2	3	4	9
c. Met **student** needs regarding equipment, technical support, and training for the use of instructional technologies	1	2	3	4	9
d. Provided incentives and rewards to faculty for integrating instructional technology into the classroom	1	2	3	4	9
e. Used instructional technologies to improve the overall quality of education at your institution	1	2	3	4	9
f. Used communications technologies (such as e-mail, networking, etc.) to increase the frequency, convenience, and/or quality of **student-faculty** interactions	1	2	3	4	9

Thank you very much for your participation.

Please return this completed questionnaire in the enclosed business-reply envelope to:
SRI International, Survey Research Program, Menlo Park, CA 94025-3493

CORPORATION FOR PUBLIC BROADCASTING
A Quarter Century of Quality Programming

901 E Street, NW
Washington, DC 20004-2037
(202) 879-9600

Library Questionnaire

Spring, 1994

Dear Colleague:

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- Use of computer technologies in the libraries.
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- Use of audio, video, and multimedia technologies in the classroom.
- Use of audio, video, multimedia, and computer technologies in teacher education.
- Use of distance education technologies.
- Institutional policies and chief academic officers' perceptions of current and future use of instructional technologies.

Two additional questionnaires will assess faculty and student experiences and opinions about computers and other instructional technologies.

This questionnaire concerns the use of computer technologies in the libraries at your institution. Either you personally or another representative of your institution has informed us that you are the person most knowledgeable about these issues. ***Your participation is very important to the overall accuracy of the survey results, even if your library makes very little use of computer technologies.*** Your responses will be held strictly confidential.

In appreciation for your participation, we will provide the chief academic officer at your institution with a summary report of the study results. In addition, we will be pleased to work with you or another representative of your institution to provide a customized analysis of the study data.

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Sincerely,

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Executive Vice President

This study is endorsed by:

American Association of Colleges for Teacher Education

American Association of Community and Junior Colleges

American Association for Higher Education

American Association of State Colleges and Universities

Association of American Colleges

CAUSE (Association for Information Technology Managers)

Council of Independent Colleges

Educom

National Association of State Universities and Land-Grant Colleges

National University Continuing Education Association

1994 STUDY OF COMMUNICATIONS TECHNOLOGY IN HIGHER EDUCATION

Library Questionnaire

☛ All questions refer to your institution's **main library**. (If in doubt, please answer for the library used by the most students.)

ONLINE CATALOG

1. Is any of your (main) library catalog in electronic format (e.g, online, CD ROM)?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes...1 ☛ *Please continue*
No..2
No, but we expect to begin putting it in electronic format within the next 3 years.......3 } *Please skip to question 7 on page 2*

2. What kind of platform does your library use for its online catalog?
*(PLEASE CIRCLE **ONE** NUMBER)*

Off-campus computer operated by an outside organization.............1
On-campus computer dedicated to library functions.........................2
On-campus computer used for library and other functions 3

3. About what percentage of your library's **existing collection** has been entered into the online catalog?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

Less than 25%	25% to 49%	50% to 74%	75% to 99%	100%	Have No Idea
1	2	3	4	5	9

☛ ***If 100%, please skip to question 5***

4. Do you anticipate entering more of your **existing collection** into the online catalog within the next 3 years?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes...................................1
No.....................................2

5. In which of the following ways can the online catalog currently be accessed?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

From terminals/PCs in the library	1
From hard-wired terminals outside the library	2
Through dialup access from outside the library	3
Through a campus network	4
Through an outside network (e.g., Internet)	5

6. Which of the following, if any, can **library patrons** currently do electronically?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Check their borrowing record	1
Determine whether a book is available	2
Request delivery of (hard copy) library documents	3
Receive library documents in electronic format	4
Initiate interlibrary loans	5
Ask reference questions	6
None of the above	0

7. Are there plans to expand electronic access to library services over the next 3 years?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes	1
No	2

8. Does the library ever deliver documents **by fax** as a service to any of its patrons?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes	1
No	2

ELECTRONIC-FORMAT JOURNALS

9. Does your library currently subscribe to any electronic journals (that is, periodicals, serials, etc., provided in electronic format rather than paper copies)?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes	1
No	2 ☛ *Please skip to question 12*

10. To about how many electronic journals does your library currently subscribe?
*(PLEASE PROVIDE YOUR **BEST ESTIMATE**)*

Number of electronic journals: ____________

11. In which of the following ways can electronic journals be accessed by patrons?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

From terminals/PCs in the library.................................. 1
From hard-wired terminals outside the library............. 2
Through dialup access from outside the library........... 3
Through a campus network.. 4
Through an outside network (e.g., Internet)................ 5
Through CD ROMs available for loan to patrons........ 6
The library provides paper copies of electronic journal articles.. 7

INSTRUCTIONAL MEDIA SERVICES

12. Are microcomputers available in the library for **general-purpose use** by either faculty or students?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Yes, for faculty use.......... 1
Yes, for student use........ 2
No.................................. 3

13. Which of the following, if any, does your library have available for loan to patrons or for use in the library?
*(PLEASE CIRCLE **ALL THAT APPLY** IN **EACH** COLUMN)*

	Available for Loan	**Available for Use in the Library**
Records, audio tapes, and/or audio CDs	1	1
Videotapes	2	2
Films	3	3
Microfiche or microfilm	4	4
Electronic materials that integrate text and visual images, such as CD ROM-based encyclopedia	5	5
Other CD ROMs (text-only CDs, databases, etc.)	6	6
Other computer software	7	7
Video materials produced by public television (PBS Video, Annenberg/CPB Project telecourses, etc.)	8	8
Audio materials produced by National Public Radio (NPR) or by American Public Radio (APR)	9	9
None of the above	0	0

NETWORKING

14. Is your library connected with the Internet or Bitnet?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1

No.................................... 2 ☛ *Please skip to question 18*

15. Does the library provide a means through which faculty or student library patrons can directly access any Internet/Bitnet services?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Yes, faculty library patrons have direct access 1

Yes, student library patrons have direct access....... 2

No... 3 ☛ *Please skip to question 18*

16. Which of the following kinds of assistance, if any, is provided to library patrons accessing the Internet/Bitnet?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Menus have been developed to facilitate access 1

Library staff provide training, answer questions, etc. 2

Manuals are provided... 3

Other kinds of assistance 4

None of the above 0

17. Does your library maintain a file server to enable text files to be downloaded via a campus network or Internet or Bitnet (for example, an FTP)?
*(PLEASE CIRCLE **ONE** NUMBER IN **EACH** ROW)*

	Yes	No
a. Via a campus network	1	2
b. Via Internet/Bitnet	1	2

18. Does your library have access to any external online or CD-ROM-based bibliographic resources (DIALOG, ERIC, etc.)? *(Please do **not** include the library's own card catalog.)*
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Yes, online 1

Yes, CD-ROM-based 2

No, neither....................... 3 ☛ *Please skip to question 21*

19. Which of the following groups have direct access to any of the library's external bibliographic resources (DIALOG, ERIC, etc.)?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Faculty.. 1
Students 2
Library staff... 3
Other staff at your institution..................4
General public.......................................5

20. Who pays for faculty and student use of external bibliographic resources (DIALOG, ERIC, etc.)?
*(PLEASE CIRCLE **ONE** NUMBER IN **EACH** ROW)*

	End User Pays Full Cost	**User Pays Some of the Cost (Library Subsidizes the Cost)**	**Library Makes the Service Available at No Cost to User**	**Varies by Service or by Resources Used**
a. Faculty use	1	2	3	4
b. Student use	1	2	3	4

21. Does your library have online access to any external full-text resources (e.g., NEXIS)?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes..1
No...2 ☛ *Please skip to question 24*

22. Which of the following groups have direct online access to any of the external full-text resources to which your library provides access (e.g., NEXIS)?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Faculty.. 1
Students 2
Library staff... 3
Other staff at your institution 4
General public.......................................5

23. Who pays for faculty and student use of external full-text resources such as NEXIS?
*(PLEASE CIRCLE **ONE** NUMBER IN **EACH** ROW)*

	End User Pays Full Cost	**User Pays Some of the Cost (Library Subsidizes the Cost)**	**Library Makes the Service Available at No Cost to User**	**Varies by Service or by Resources Used**
a. Faculty use	1	2	3	4
b. Student use	1	2	3	4

24. **In which of the following cooperative practices, if any, is your library currently engaged with other institutions?**
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Cooperative development or purchase of electronic information........... 1
Sharing the cost of database licensing.. 2
Patron/staff access to other libraries' online catalogs............................ 3
Allowing other libraries to access your online catalog............................ 4
Electronic interlibrary loan.. 5
None of the above.. 0

ELECTRONIC PUBLISHING

25. **In the past 12 months,** has your **institution** published any materials electronically?

☛ *By "electronic publishing, we mean the public issuance of text, graphics, and/or video in electronic format, such as online, CD ROM, etc.*

*(PLEASE CIRCLE **ONE** NUMBER)*

Yes.. 1
No... 2 ☛ *Please skip to question 28*

26. Which entities within your institution are responsible for production and distribution of electronic publications?
*(PLEASE CIRCLE **ALL THAT APPLY** IN **EACH** ROW)*

	Library	**Academic Computing**	**Media Services**	**College/ University Press**	**Academic Department(s)**	**Other**
a. Production	1	2	3	4	5	6
b. Distribution	1	2	3	4	5	6

27. **In the past 12 months,** approximately how many of each of the following kinds of titles has your institution published electronically?
*(PLEASE PROVIDE YOUR **BEST ESTIMATES**; IF "DON'T KNOW," ENTER "99")*

a. Number of serials: _______________

b. Number of monographs and other publications: _______________

TRAINING AND SUPPORT ACTIVITIES

28. Which of the following changes, if any, have been made by your library in the past 3 years to support access to electronic information?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Resources (dollars/staff time) have been increased for training end-users and/or library staff in use of electronic media	1
Resources (dollars/staff time) have been increased for library automation activities and/or electronic technologies	2
Resources (dollars/staff time) have been shifted from print media to electronic media	3
Changes have been made in branch library structure due to the electronic availability of materials	4
None of the above	0

29. On which of the following topics, if any, do library staff offer formal training or informal assistance for faculty and students?
*(PLEASE CIRCLE **ALL THAT APPLY** IN **EACH** COLUMN)*

	Doesn't Apply: This Topic Not Relevant Here	**Formal Training**		**Informal Assistance**	
		For Faculty	**For Students**	**For Faculty**	**For Students**
Searching of electronic data bases	1	1	1	1	1
Use of online catalogs	2	2	2	2	2
Use of Internet/Bitnet resources	3	3	3	3	3
None of the above	xx	0	0	0	0

INSTITUTIONAL POLICIES AND PLANS

30. **Over the next 3 years,** do you think that your **institution's expenditures** for each of the following are likely to increase, remain the same, or decrease?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Doesn't Apply: Not a Current or Likely Future Area of Expenditures	**Increase**	**Stay the Same**	**Decrease**	**Have No Idea**
a. Training and equipment for library **staff** to use electronic media	0	1	2	3	9
b. Training and equipment for library **patrons** to use electronic media	0	1	2	3	9
c. Subscriptions to electronic journals	0	1	2	3	9
d. Access to online or CD ROM bibliographic resources, such as DIALOG or ERIC	0	1	2	3	9
e. Access to online or CD ROM full-text resources, such as NEXIS	0	1	2	3	9
f. Production of electronic publications	0	1	2	3	9
g. Holdings of videotapes	0	1	2	3	9
h. Holdings of CD ROMs	0	1	2	3	9
i. Holdings of other computer software for patrons' use	0	1	2	3	9
j. Digitization of text	0	1	2	3	9
k. Digitization of sound recordings and/or images	0	1	2	3	9

31. How much of an impediment do you think each of the following is to the expansion of automation in your library?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Not An Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
a. Insufficient funds	1	2	3	4	9
b. Lack of top administrators' interest in expanded automation of the library	1	2	3	4	9
c. Lack of strategic planning	1	2	3	4	9
d. Lack of appropriate library organizational structure	1	2	3	4	9
e. Library staff technophobia	1	2	3	4	9
f. Library patron technophobia	1	2	3	4	9
g. Inadequate library staff computer skills	1	2	3	4	9
h. Inadequate library patron computer skills	1	2	3	4	9
i. Lack of staff knowledgeable about electronic media (such as online resources, CD ROMs, networks, etc.)	1	2	3	4	9
j. Lack of staff who can provide training in use of electronic media	1	2	3	4	9
k. Lack of space	1	2	3	4	9
l. Incompatible or inappropriate hardware/software	1	2	3	4	9
m. Complicated user interfaces	1	2	3	4	9
n. Lack of network access	1	2	3	4	9
o. Copyright issues	1	2	3	4	9

32. In your opinion, how well has your institution accomplished the following?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Not At All	Not Very Well	Moderately Well	Very Well	Have No Idea
a. Used instructional technologies to improve the overall quality of education at your institution	1	2	3	4	9
b. Used communications technologies (such as e-mail, networking, etc.) to increase the frequency, convenience, and/or quality of **student-faculty** interactions	1	2	3	4	9

Thank you very much for your participation.

Please return this completed questionnaire in the enclosed business-reply envelope to:
SRI International, Survey Research Program, Menlo Park, CA 94025-3493

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901 E Street, NW
Washington, DC 20004-2037
(202) 879-9600

Teacher Education Questionnaire

This study is endorsed by:

- *American Association of Colleges for Teacher Education*
- *American Association of Community and Junior Colleges*
- *American Association for Higher Education*
- *American Association of State Colleges and Universities*
- *Association of American Colleges*
- *CAUSE (Association for Information Technology Managers)*
- *Council of Independent Colleges*
- *Educom*
- *National Association of State Universities and Land-Grant Colleges*
- *National University Continuing Education Association*

Spring, 1994

Dear Colleague:

The Corporation for Public Broadcasting (CPB) is conducting a comprehensive, multi-faceted national survey of 1,000 higher education institutions on the instructional uses of communications technology, including audio, video, multimedia, and computers. (CPB is a private, non-profit corporation created by Congress in 1967 to oversee the growth of public radio and television in the United States.) This study will help us plan for the future of public telecommunications, and it will help educators, policymakers, and funders and producers of educational programming develop better and more effective products.

The study includes six institutional-level questionnaires designed to assess:

- Use of audio, video, multimedia, and computer technologies in teacher education.
- Availability and ways in which computers are used for instructional purposes.
- Use of audio, video, and multimedia technologies in the classroom.
- Use of computer technologies in the libraries.
- Use of distance education technologies.
- Institutional policies and chief academic officers' perceptions of current and future use of instructional technologies.

Two additional questionnaires will assess faculty and student experiences and opinions about computers and other instructional technologies.

This questionnaire concerns the use of audio, video, multimedia, and computer technologies in teacher education at your institution. Either you personally or another representative of your institution has informed us that you are the person most knowledgeable about these issues. *Your participation is very important to the overall accuracy of the survey results.* Your responses will be held strictly confidential.

In appreciation for your participation, we will provide the chief academic officer at your institution with a summary report of the study results. In addition, we will be pleased to work with you or another representative of your institution to provide a customized analysis of the study data.

Please complete this questionnaire as soon as possible and return it in the enclosed business-reply envelope. CPB has engaged SRI International (formerly Stanford Research Institute) to conduct this study. If you have any questions, please contact SRI project director Dr. Susan Russell, at 415/859-4164, or CPB project coordinator Ms. Wendy Charlton, at 202/879-9672.

Thank you in advance for your cooperation.

Sincerely,

Robert T. Coonrod
Executive Vice President

1994 STUDY OF COMMUNICATIONS TECHNOLOGY IN HIGHER EDUCATION

Teacher Education Questionnaire

☛ **Questions about students in this questionnaire are concerned exclusively with teacher education students--that is, students who are preparing to become teachers.**

1. **During the 1993 Fall Term**, which of the following kinds of **teacher education** students (that is, **students preparing to become teachers**) were enrolled in the School/Department of Education in your institution?

(PLEASE CIRCLE ALL THAT APPLY)

Undergraduate students majoring in teacher education 1

Pre-service teacher education graduate students (those who have not taught for pay, either full-time or part-time, in a school setting) 2

In-service teacher education graduate students (those who have had at least some experience teaching for pay in a school setting) 3

} *Please continue*

The school/department has no students who are specifically preparing to become teachers ....0 ☛ *Please stop here and return this questionnaire to SRI in the enclosed envelope*

2. Does your institution offer any courses at a distance to in-service teacher education students?

☛ By **"at a distance,"** we mean the delivery of instruction to students located at a **remote off-campus site or sites,** physically removed from the instructor. This includes both one-way and two-way delivery of instruction by print (e.g., correspondence courses), audio, video, and/or computer technologies. It does **not** include courses in which the instructor travels to a satellite campus or off-campus location to deliver the instruction in-person.

(PLEASE CIRCLE ONE NUMBER)

Yes 1

No 2

☛ **Questions 3-8 concern training provided to teacher education students in instructional uses of computers. Questions 13-18 concern training in instructional uses of audio, video, and multimedia technologies.**

TRAINING IN INSTRUCTIONAL USES OF COMPUTERS

3. Does your institution offer any kind of training in the instructional uses of computers to any teacher education students?

(PLEASE CIRCLE ONE NUMBER)

Yes 1
No .... 2 ☛ *Please skip to question 9, on page 4*

4. In which of the following ways is training in instructional uses of computers provided to teacher education students in your School/Department of Education?

*(PLEASE CIRCLE **ALL THAT APPLY**)*

Integrated with instructional technology courses...... 1
Integrated with other teacher education courses..... 2
Taught separately 3

5. Which of the following kinds of training in instructional uses of computers are offered as an elective to or required of at least some types of undergraduate and graduate teacher education students?

*(PLEASE CIRCLE **ALL THAT APPLY** IN EACH COLUMN)*

	OFFERED TO AT LEAST SOME:		REQUIRED OF AT LEAST SOME:	
	Undergraduate Majors	Graduate Students	Undergraduate Majors	Graduate Students
a. Use of computers in instructional management, such as testing, record-keeping, planning individualized instruction, etc.	1	1	1	1
b. Use of computers for delivery of programmed instruction, such as tutorials, drill and practice, etc.	2	2	2	2
c. Use of computers for interactive control of audio or video materials	3	3	3	3
d. Use of instructional software	4	4	4	4
e. Selecting instructional software	5	5	5	5
f. Integrating computer use with overall instructional methods	6	6	6	6
g. Integrating computer use with overall curriculum content	7	7	7	7
h. Developing courseware for instruction in classrooms, such as building Hypercard stacks	8	8	8	8
i. Managing multiple small groups of students using computers	9	9	9	9
j. Accessing and using networks, such as Internet, FredMail, Learning Link, etc.	10	10	10	10
k. Using data bases accessed by computer networks	11	11	11	11
l. None of the above	0	0	0	0

6. For which of the teacher education specialties listed below does your School/Department of Education offer a program, and for which programs do you require training in instructional uses of computers for undergraduate and graduate teacher education students?

*(PLEASE CIRCLE **ALL THAT APPLY** IN **EACH** COLUMN)*

	We Offer A Program In This Specialty	TRAINING IN INSTRUCTIONAL USES OF COMPUTERS IS REQUIRED FOR THESE STUDENTS: Undergraduate Majors	Graduate Students
Early childhood/preschool	1	1	1
Elementary school	2	2	2
Secondary school	3	3	3
Adult basic education	4	4	4
Special education	5	5	5

7. **On average,** how many total hours of training in instructional uses of computers (topics indicated in question 5) are **required** of undergraduate majors and graduate teacher education students to complete their degree?

☛ *By "hours," we mean actual hours of training, not credit hours.*

*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR **EACH** GROUP)*

	No Students of This Type	AVERAGE TOTAL HOURS OF TRAINING REQUIRED IN INSTRUCTIONAL USES OF COMPUTERS: None	1 to 20	21 to 50	51 to 80	More than 80	Have No Idea
a. Undergraduate majors	0	1	2	3	4	5	9
b. Graduate students	0	1	2	3	4	5	9

8. **On average,** how many total hours of training in instructional uses of computers (topics indicated in question 5) are **usually taken** by undergraduate majors and graduate teacher education students in completing their degree?

☛ *By "hours," we mean actual hours of training, not credit hours.*

*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR **EACH** GROUP)*

	No Students of This Type	AVERAGE TOTAL HOURS OF TRAINING USUALLY TAKEN IN INSTRUCTIONAL USES OF COMPUTERS: None	1 to 20	21 to 50	51 to 80	More than 80	Have No Idea
a. Undergraduate majors	0	1	2	3	4	5	9
b. Graduate students	0	1	2	3	4	5	9

9. **Are microcomputers or workstations available for class instructional time or out-of-class use by your teacher education students?**
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Available for class instructional time 1

Available for out-of-class use 2

Not available...3

10. Has your School/Department of Education organized any kind of electronic network service (e-mail, electronic bulletin board, etc.) through which current students, alumni, teachers, and/or others can share problems, discuss instructional issues, and so on?
*(PLEASE CIRCLE **ONE NUMBER**)*

Yes 1

No... 2

11. What percentage of the faculty and students in your School/Department of Education would you estimate **use computers more than once a week** for instructional or research purposes?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR **EACH** GROUP)*

	No Students of This Type	**Fewer than 25%**	**25% to 49%**	**50% to 74%**	**75% to 90%**	**More than 90%**	**Have No Idea**
a. Faculty	xx	1	2	3	4	5	9
b. Undergraduate majors	0	1	2	3	4	5	9
c. Graduate students	0	1	2	3	4	5	9

12. For what percentage of the **faculty** in your School/Department of Education does your institution provide a microcomputer or workstation for their sole use?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

Fewer than 25%	**25% to 49%**	**50% to 74%**	**75% to 90%**	**More than 90%**	**Have No Idea**
1	2	3	4	5	9

AUDIO, VIDEO, AND MULTIMEDIA TECHNOLOGIES

☛ **Video technologies (carry picture and sound):** Broadcast, cable, or closed-circuit television; videocassettes; videodiscs; video projection systems.

Audio technologies (carry sound only): audio cassettes, audiotapes, audio CDs, records, radio.

Multimedia: Computer-mediated integration of text, audio, and/or video technologies--for example, microcomputers linked to and controlling videodisc players, CD ROMs, video/audio projection units, or slide or video digitizers.

13. Does your institution offer any kind of training in the instructional uses of audio, video, or multimedia technologies to any teacher education students?
*(PLEASE CIRCLE **ONE NUMBER**)*

Yes..1

No...2 ☛ *Please skip to question 18 on page 6*

14. In which of the following ways is training in instructional uses of audio, video, and/or multimedia technologies provided to teacher education students in your School/Department of Education?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Integrated with instructional technology courses...... 1
Integrated with other teacher education courses 2
Taught separately 3

15. Which of the following kinds of training in instructional uses of audio, video, or multimedia technologies are offered as an elective to or required of at least some types of undergraduate majors and graduate teacher education students?
*(PLEASE CIRCLE **ALL THAT APPLY** IN EACH COLUMN)*

	OFFERED TO AT LEAST SOME:		REQUIRED OF AT LEAST SOME:	
	Undergraduate Majors	Graduate Students	Undergraduate Majors	Graduate Students
a. Use of film, slide, or overhead projectors for instructional purposes	1	1	1	1
b. Selecting audio and/or video programs for use in instruction	2	2	2	2
c. Producing or designing audio programs for use in instruction	3	3	3	3
d. Producing or designing video programs for use in instruction	4	4	4	4
e. Use of live interactive television in instruction	5	5	5	5
f. Producing or designing multimedia programs for use in instruction	6	6	6	6
g. Use of multimedia for self-paced, individualized instruction	7	7	7	7
h. Use of multimedia for classroom presentations	8	8	8	8
i. Integrating audio, video, or multimedia use with overall instructional methods and/or curriculum content	9	9	9	9
j. Use of audio, video, or multimedia technologies for courses taught at a distance	10	10	10	10
k. None of the above	0	0	0	0

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16. **On average,** how many total hours of training in instructional uses of audio, video, and multimedia technologies (topics indicated in question 15) are **required** of undergraduate majors and graduate teacher education students to complete their degree?

☛ *By "hours," we mean actual hours of training, not credit hours.*

*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR **EACH** GROUP)*

		AVERAGE TOTAL HOURS OF TRAINING REQUIRED IN INSTRUCTIONAL USES OF AUDIO, VIDEO, AND MULTIMEDIA					
	No Students of This Type	None	1 to 20	21 to 50	51 to 80	More than 80	Have No Idea
a. Undergraduate majors	0	1	2	3	4	5	9
b. Graduate students	0	1	2	3	4	5	9

17. **On average,** how many total hours of training in instructional uses of audio, video, and multimedia technologies (topics indicated in question 15) are **usually taken** by undergraduate majors and graduate teacher education students in completing their degree?

☛ *By "hours," we mean actual hours of training, not credit hours.*

*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR **EACH** GROUP)*

		AVERAGE TOTAL HOURS OF TRAINING USUALLY TAKEN IN INSTRUCTIONAL USES OF AUDIO, VIDEO, AND MULTIMEDIA					
	No Students of This Type	None	1 to 20	21 to 50	51 to 80	More than 80	Have No Idea
a. Undergraduate majors	0	1	2	3	4	5	9
b. Graduate students	0	1	2	3	4	5	9

18. To your knowledge, about what percentage of the **faculty** in your School/Department of Education used each of the following in any of their courses **during the 1993 Fall Term?**

☛ *Please **do not** include use of these technologies in courses that were offered **only** as distance education courses.*

*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR **EACH** ITEM)*

	PERCENTAGE OF FACULTY WHO USED EACH LISTED TECHNOLOGY DURING THE 1993 FALL TERM:					
	None	Fewer than 10%	10% to 25%	26% to 50%	More than 50%	Have No Idea
a. Computers	0	1	2	3	4	9
b. Audio technologies	0	1	2	3	4	9
c. Video technologies	0	1	2	3	4	9
d. Multimedia technologies	0	1	2	3	4	9

19. **Over the next 3 years,** do you think that each of the following is likely to increase, stay the same, or decrease in your School/Department of Education?

(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	No Students of This Type	Increase	Stay the Same	Decrease	Have No Idea
a. Amount of training provided to **undergraduate** teacher education majors in instructional uses of computers and audio, video, and multimedia technologies	0	1	2	3	9
b. Amount of training provided to teacher education **graduate students** in instructional uses of computers and audio, video, and multimedia technologies	0	1	2	3	9
c. Use of computers and audio, video, and multimedia technologies by **faculty** in teacher education courses	xx	1	2	3	9

20. **Over the next 3 years,** do you think that the **expenditures** of your School/Department of Education for each of the following are likely to increase, stay the same, or decrease?

(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	Doesn't Apply: Not a Current or Likely Future Area of Expenditures	Increase	Stay The Same	Decrease	Have No Idea
a. Purchase or upgrading of audio equipment	0	1	2	3	9
b. Purchase or upgrading of video equipment	0	1	2	3	9
c. Purchase or upgrading of multimedia equipment	0	1	2	3	9
d. Purchase or upgrading of computers **for instructional purposes**	0	1	2	3	9
e. Instructional-technologies technical support	0	1	2	3	9

21. In your opinion, how much of an impediment is each of the following to the increased use of instructional technologies in teacher education at your institution?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Not An Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
a. Insufficient funds	1	2	3	4	9
b. Lack of top administrators' interest in expanded use of instructional technologies	1	2	3	4	9
c. Lack of faculty interest in expanded use of instructional technologies	1	2	3	4	9
d. Lack of incentives/rewards to faculty for using instructional technologies	1	2	3	4	9
e. Lack of strategic planning	1	2	3	4	9
f. Lack of appropriate organizational structures	1	2	3	4	9
g. Lack of appropriate instructional software	1	2	3	4	9
h. Lack of appropriate equipment	1	2	3	4	9
i. Lack of infrastructure (e.g., cabling, power outlets, etc.)	1	2	3	4	9
j. Faculty technophobia	1	2	3	4	9
k. Student technophobia	1	2	3	4	9
l. Inadequate faculty technical skills	1	2	3	4	9
m. Inadequate student technical skills	1	2	3	4	9
n. Lack of staff who can provide training in instructional technologies	1	2	3	4	9
o. Copyright issues	1	2	3	4	9

22. In your opinion, how well has your School/Department of Education accomplished the following? *(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	No Students of This Type	Not At All	Not Very Well	Moderately Well	Very Well	Have No Idea
a. Developed clear plans for the use of instructional technology in its teacher education program	xx	1	2	3	4	9
b. Met faculty needs regarding equipment, technical support, and training for the use of instructional technologies	xx	1	2	3	4	9
c. Provided incentives and rewards for faculty to integrate instructional technologies into the classroom	xx	1	2	3	4	9
d. Met the needs of **undergraduate** teacher education majors regarding equipment, technical support, and training for the use of instructional technologies	0	1	2	3	4	9
e. Met the needs of teacher education **graduate students** regarding equipment, technical support, and training for the use of instructional technologies	0	1	2	3	4	9
f. Enabled your **undergraduate** teacher education majors to use instructional technologies effectively as classroom teachers	0	1	2	3	4	9
g. Enabled your teacher education **graduate students** to use instructional technologies effectively as classroom teachers	0	1	2	3	4	9
h. Used instructional technologies to improve the overall quality of education at your School/ Department of Education	xx	1	2	3	4	9
i. Used communications technologies (such as e-mail, networking, etc.) to increase the frequency, convenience, and/or quality of **student-faculty** interactions	xx	1	2	3	4	9

Thank you very much for your participation.

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Distance Education Questionnaire

This study is endorsed by:

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American Association for Higher Education

American Association of State Colleges and Universities

Association of American Colleges

CAUSE (Association for Information Technology Managers)

Council of Independent Colleges

Educom

National Association of State Universities and Land-Grant Colleges

National University Continuing Education Association

Spring, 1994

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The study includes six institutional-level questionnaires designed to assess:

- Use of distance education technologies.
- Availability and ways in which computers are used for instructional purposes.
- Use of audio, video, and multimedia technologies in the classroom.
- Use of audio, video, multimedia, and computer technologies in teacher education.
- Use of computer technologies in the libraries.
- Institutional policies and chief academic officers' perceptions of current and future use of instructional technologies.

Two additional questionnaires will assess faculty and student experiences and opinions about computers and other instructional technologies.

This questionnaire concerns the use of distance education technologies at your institution. Either you personally or another representative of your institution has informed us that you are the person most knowledgeable about these issues. *Your participation is very important to the overall accuracy of the survey results*. Your responses will be held strictly confidential.

In appreciation for your participation, we will provide the chief academic officer at your institution with a summary report of the study results. In addition, we will be pleased to work with you or another representative of your institution to provide a customized analysis of the study data.

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Thank you in advance for your cooperation.

Sincerely,

Robert T. Coonrod
Executive Vice President

1994 STUDY OF COMMUNICATIONS TECHNOLOGY IN HIGHER EDUCATION

Distance Education Questionnaire

☛ By "**distance education,**" we mean the delivery of instruction to students, most of whom are located at a remote off-campus site or sites (including their homes), physically removed from the instructor.

Includes: Both one-way and two-way delivery of instruction by print (e.g., correspondence courses), audio, video, and/or computer technologies.

Does **not** include: Courses in which the only distance education component is an accommodation for students with disabilities or courses in which the instructor travels to a satellite campus or off-campus location to deliver the instruction in person.

☛ Unless otherwise specified, this questionnaire asks about **for-credit** distance education courses offered by your institution during the **1993 Fall Term.**

1. **During the 1993 Fall Term, did** your institution offer any **for-credit** distance education courses, at either the undergraduate or graduate level?
(PLEASE CIRCLE ONE NUMBER)

Yes	1	☛ *Please continue*
No	2	☛ *Please stop here and return this questionnaire in the enclosed business reply envelope to SRI International.*

2. Who is involved in determining what distance education courses your institution will offer?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Centralized distance education program, center, etc.	1
Academic department(s)	2
Academic division/school	3
Other	4

3. Which of the following **best** describes how the delivery of your institution's distance education courses is currently organized?
(PLEASE CIRCLE ONE NUMBER)

All distance education courses are coordinated by a centralized program, center, etc. (this program/center may or may not have other responsibilities besides distance education)	1
Two or more academic departments or other organizational units work together to provide distance education courses	2
Academic departments work independently to provide distance education courses	3
Some departments work independently and some work through a centralized program	4
Other organizational structure *(please specify:)* ______________________	5

____

PRINT-BASED CORRESPONDENCE COURSES

4. Are any for-credit print-based correspondence courses currently offered by your institution?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes..1
No...2 ☛ *Please skip to question 7*

5. How many for-credit print-based correspondence courses are currently offered by your institution, and about how many students are enrolled?
*(PLEASE ENTER YOUR **BEST ESTIMATES**; IF "DON'T KNOW," ENTER "99")*

Total Number of For-Credit Print-Based Correspondence Courses Currently Offered	Total Number of Print-Based Correspondence Course Students Currently Enrolled
______________	____________________

6. **Over the next 3 years,** do you think that the number of **print-based correspondence** courses offered by your institution is likely to increase, stay the same, or decrease?
*(PLEASE CIRCLE **ONE** NUMBER)*

Increase	Stay the Same	Decrease	Have No Idea
1	2	3	9

☛ *The remaining questions are concerned with **technology-based** distance education courses. Please do not include print-based correspondence courses in your responses to these questions.*

TECHNOLOGY-BASED DISTANCE EDUCATION COURSES

7. **During the 1993 Fall Term,** did your institution offer any for-credit **technology-based** distance education courses?

☛ By **"technology-based distance education,"** we mean the delivery of instruction by **audio, video, and/or computer technologies** to students, most of whom are located at a **remote off-campus site or sites** (including their homes), physically removed from the instructor. Do **not** include courses in which the only distance education component is an accommodation for students with disabilities.

*(PLEASE CIRCLE **ONE** NUMBER)*

Yes..1 ☛ *Please continue*
No...2 ☛ *Please stop here and return this questionnaire in the enclosed business reply envelope to SRI International.*

8. **During the 1993 Fall Term,** in how many for-credit distance education courses offered by your institution was each of the following technologies used?

☛ ***Courses that involve more than one technology should be counted under each applicable technology. For example, a course involving two-way audio and one-way live video should be counted in both category c and category d.***

*(PLEASE ENTER YOUR **BEST ESTIMATES**; IF NONE, ENTER "0"; IF "DON'T KNOW," ENTER "99")*

	Number of For-Credit Courses In Which This Technology Was Used
a. Two-way interactive video	______
b. Two-way online (computer-based) communication among instructor and students during the delivery of instruction	______
c. Two-way audio communication among instructor and students during the delivery of instruction	______
d. One-way **live** video	______
e. One-way **pre-recorded** video with relatively little production effort (e.g., videotaped recording of a lecture course)	______
f. One-way **pre-recorded** video involving a significant investment in production (e.g., involving narrated documentary, simulations, graphics, etc.), produced either at your institution or elsewhere	______
g. One-way audio (radio broadcast, audiotapes, etc.)	______
h. Self-paced computer-based instruction	______
i. Other audio, video, or computer-based technologies	______

9. **During the 1993 Fall Term,** what was the **total** number of for-credit technology-based distance education courses offered by your institution (i.e., all those included in question 8), and about how many students were enrolled?

(PLEASE ENTER YOUR **BEST ESTIMATES**; IF "DON'T KNOW," ENTER "99")

Total Number of For-Credit Technology-Based Distance Education Courses Offered in the 1993 Fall Term	Total Number of Students Enrolled in Technology-Based Distance Education Courses During the 1993 Fall Term
______	______

10. **During the 1993 Fall Term,** in how many of the distance education courses listed in question 8 was a teaching assistant or facilitator **regularly** present at the site(s) where most students received instruction?

*(PLEASE ENTER YOUR **BEST ESTIMATE**)*

Number of courses: ______

11. **During the 1993 Fall Term,** how many for-credit technology-based distance education courses did your **institution offer for undergraduates, and how many were offered for graduate students?**
(PLEASE ENTER YOUR ***BEST ESTIMATES****; IF NONE, ENTER "0"; IF "DON'T KNOW," ENTER "99")*

☛ ***If a course could be taken for either undergraduate or graduate credit, please count it as an*** ***undergraduate*** ***course. Please do not count the same course twice.***

a. Number of technology-based distance education courses for undergraduates....... ________

b. Number of technology-based distance education courses for graduate students... ________

12. Of the undergraduate and graduate-level courses listed in question 11, how many used a **two-way interactive method** (categories a, b, or c on question 8)?
(PLEASE ENTER YOUR ***BEST ESTIMATES****; IF NONE, ENTER "0"; IF "DON'T KNOW," ENTER "99")*

☛ ***If a course could be taken for either undergraduate or graduate credit, please count it as an*** ***undergraduate*** ***course. Please do not count the same course twice.***

a. Number of undergraduate courses that used a two-way interactive method .... ________

b. Number of graduate-level courses that used a two-way interactive method........... ________

13. Of the undergraduate and graduate-level courses listed in question 11, how many provided for **no interaction between students and instructor, including teaching assistants, etc.**? (That is, one-way video, one-way audio, or self-paced computer-based instruction with no feedback from an instructor other than written feedback on papers or exams.)
(PLEASE ENTER YOUR ***BEST ESTIMATES****; IF NONE, ENTER "0"; IF "DON'T KNOW," ENTER "99")*

☛ ***If a course could be taken for either undergraduate or graduate credit, please count it as an*** ***undergraduate*** ***course. Please do not count the same course twice.***

a. Number of undergraduate courses with no student-instructor interaction................ ________

b. Number of graduate-level courses with no student-instructor interaction................. ________

14. For each field of study listed below, please indicate:

Column 1: The total number of for-credit technology-based distance education courses offered by your institution **during the 1993 Fall Term.**

Column 2: The number that used a **two-way interactive method** (categories a, b, or c on question 8).

Column 3: The number that provided for **no interaction** **between students and instructor, including teaching assistants, etc.,** other than written feedback on papers or exams.

*(PLEASE ENTER YOUR **BEST ESTIMATES**; IF NONE, ENTER "0"; IF "DON'T KNOW," ENTER "99")*

	Column 1: Total Number of For-Credit Technology-Based Distance Education Courses	**Column 2:** Number That Used a Two-Way Interactive Method	**Column 3:** Number with NO Student-Instructor Interaction
a. Agriculture			
b. Biological, life, or physical sciences (other than health sciences)			
c. Business			
d. Computer science, mathematics, or statistics			
e. Education			
f. Engineering			
g. Fine or performing arts			
h. Health sciences			
i. Humanities			
j. Social or behavioral sciences			
k. Other fields			

15. **Over the next 3 years,** do you think that the number of each of the following types of technology-based distance education courses offered by your institution is likely to increase, remain the same, or decrease?
(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	Doesn't Apply: Don't Offer These Now and Don't Plan to Offer Them	Increase	Stay the Same	Decrease	Have No Idea
a. **Total number** of technology-based for-credit distance education courses	n.a.	1	2	3	9
b. Number that use a **two-way interactive method** (categories a, b, or c on question 8)	0	1	2	3	9
c. Number with **no student-instructor interaction**	0	1	2	3	9

16. For each of the following types of distance education courses that involve two-way interaction, does your institution use its own facilities (e.g., switches and bridges) to establish links among faculty and students, or does it use an outside supplier's facilities?
(PLEASE CIRCLE ONE NUMBER FOR EACH TYPE OF COURSE)

	Doesn't Apply: We Don't Offer These Kinds of Courses	Use Our Own Facilities	Use an Outside Supplier's Facilities	Combination of Our Own And Outside Supplier	Have No Idea
a. Two-way video	0	1	2	3	9
b. Two-way online (computer-based) communication	0	1	2	3	9
c. Two-way audio	0	1	2	3	9
d. Combination of two-way online and two-way audio	0	1	2	3	9
e. One-way video with two-way online communication	0	1	2	3	9
f. One-way video with two-way audio	0	1	2	3	9

VIDEO DISTRIBUTION SYSTEMS

- *By "video courses," we mean any course taught via* ***two-way interactive video or one-way video*** *(including live one-way video, television broadcast, videotape, pre-recorded television courses, etc.).*
- ***If your institution did not offer any video courses during the 1993 Fall Term, please skip to question 22, on page 8.***

17. Did a cable system(s) distribute any of the for-credit video courses offered by your institution during the 1993 Fall Term?
(PLEASE CIRCLE ONE NUMBER)

Yes.. 1
No.. 2 ☛ *Please skip to question 21*

18. Who programs the cable system(s) that distributes these courses?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Your institution	1
Public television station(s)	2
Community-access channel	3
Other	4

19. How many cable-system channels, if any, does **your institution program primarily for instructional purposes**?
*(PLEASE CIRCLE **ONE** NUMBER)*

None	0	☛ *Please skip to question 21*
One	1	
Two	2	
Three or more	3	

20. How many cable systems carry the instructional channels that your institution programs, and about how many subscribers do these systems have?
*(PLEASE ENTER YOUR **BEST ESTIMATES**; IF YOU HAVE NO IDEA, PLEASE ENTER "99")*

a. Number of cable systems that carry our instructional channel(s): ____________

b. Total number of subscribers: ______________________

21. **During the 1993 Fall Term**, which of the following (other than a cable system) distributed your institution's for-credit video courses?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Campus closed-circuit system	1
State or regional government delivery system (satellite or closed-circuit system, fiber-optic network, etc.)	2
Commercial television station	3
Public television station	4
Instructional television fixed service (ITFS)	5
Telephone company lines	6
Bookstore(s)	7
Home video distributor (Blockbuster, etc.)	8
Direct Broadcast Satellite (DBS) operator (DirecTV, etc.)	9
Other satellite delivery system (NTU, etc.)	10
Other non-cable system distribution methods	11
None of the above	0

22. Does your institution hold the license for any ITFS services?
(PLEASE CIRCLE ***ONE*** *NUMBER)*

Yes...1 ☛ How many? ________

No..2 ☛ *Please skip to question 24*

23. Does your institution lease any of its ITFS capacity to a commercial organization (for example, a wireless cable company)?
(PLEASE CIRCLE ***ONE*** *NUMBER)*

Yes...1

No..2

COURSE ORIGINATION AND DESTINATIONS

24. What percentage of technology-based distance education courses that your institution offered for credit during the 1993 Fall Term originated or were produced at **another** higher education institution or at a commercial or noncommercial organization (e.g., NTU, Annenberg/CPB, etc.)?
(PLEASE CIRCLE YOUR ***BEST ESTIMATE****)*

None	Fewer than 25%	25% to 49%	50% to 74%	75% or More	Have No Idea
0	1	2	3	4	9

25. Were any of the technology-based distance education courses that were produced by your institution (e.g., taught by your faculty) during the 1993 Fall Term also offered for credit by any other institutions?
(PLEASE CIRCLE ***ONE*** *NUMBER)*

Yes...1

No..2

26. For what percentage of technology-based distance education courses offered during the 1993 Fall Term did your institution have **formal arrangements with one or more employers** to provide distance education in their workplace?
(PLEASE CIRCLE YOUR ***BEST ESTIMATE****)*

None	Fewer than 25%	25% to 49%	50% to 74%	75% or More	Have No Idea
0	1	2	3	4	9

27. For what percentage of technology-based distance education courses offered during the 1993 Fall Term was it possible for students to receive instruction **in their homes**?
(PLEASE CIRCLE YOUR ***BEST ESTIMATE****)*

None	Fewer than 25%	25% to 49%	50% to 74%	75% or More	Have No Idea
0	1	2	3	4	9

28. For what percentage of technology-based distance education courses offered during the 1993 Fall Term were students required to go to a location **outside their home or workplace** to receive instruction?

(PLEASE CIRCLE YOUR ***BEST ESTIMATE****)*

None	Fewer than 25%	25% to 49%	50% to 74%	75% or More	Have No Idea
0	1	2	3	4	9

29. **Over the next 3 years,** do you think that the number of technology-based distance education courses that may be **received in students' homes** is likely to increase, remain the same, or decrease?

(PLEASE CIRCLE ***ONE*** *NUMBER)*

Doesn't Apply: Don't Offer These Now and Don't Plan to Offer Them	Increase	Stay the Same	Decrease	Have No Idea
0	1	2	3	9

30. **During the 1993 Fall Term,** about what percentage of all students enrolled in technology-based distance education courses were located...

(PLEASE CIRCLE YOUR ***BEST ESTIMATE*** *ON EACH LINE)*

	None	Fewer than 25%	25% to 49%	50% to 74%	75% or More	Have No Idea
a. Within 25 miles of campus	0	1	2	3	4	9
b. More than 25 miles from campus but within the state	0	1	2	3	4	9
c. In other state(s)	0	1	2	3	4	9
d. Outside the United States	0	1	2	3	4	9

INSTITUTIONAL PLANS AND POLICIES

31. Does your institution provide formal training in the following areas to faculty who teach technology-based distance education courses?

(PLEASE CIRCLE ***ONE*** *NUMBER FOR* ***EACH*** *ITEM)*

Doesn't apply: None of **our** faculty teach technology-based distance education courses............................... 0 ☛ *Please skip to question 32*

	Yes	No	Have No Idea
a. **Training in the use and applications of distance education technologies**	1	2	9
b. **Training in the development of curricula for distance education courses**	1	2	9

32. How many of the students enrolled in your institution's technology-based distance education courses have the following?
(PLEASE CIRCLE ***ONE*** *NUMBER FOR* ***EACH*** *ITEM)*

Types of Assistance Available for Distance Education Students:	**None**	**Some**	**Most**	**All**	**Have No Idea**
a. Opportunities to receive orientation/training in methods used in distance education courses	0	1	2	3	9
b. Face-to-face access to instructors	0	1	2	3	9
c. Face-to-face access to counselors and/or advisors	0	1	2	3	9
d. Toll-free telephone access to instructors	0	1	2	3	9
e. Toll-free telephone access to counselors and/or advisors	0	1	2	3	9
f. E-mail or other online access to instructors	0	1	2	3	9
g. E-mail or other online access to counselors and/or advisors	0	1	2	3	9
h. Opportunities to interact with other students (either in person or at a distance)	0	1	2	3	9
i. Easy access to bookstore resources (by mail, telephone, or e-mail)	0	1	2	3	9
j. Easy access to library resources and services (by mail, telephone, or e-mail)	0	1	2	3	9

33. How many of your institution's technology-based distance education courses are required to...?
(PLEASE CIRCLE ***ONE*** *NUMBER FOR* ***EACH*** *ITEM)*

	None	**Some**	**Most**	**All**	**Have No Idea**
a. Recover at least 50% of their costs	0	1	2	3	9
b. Recover all of their costs	0	1	2	3	9
c. Generate revenues in excess of their costs	0	1	2	3	9

34. Is tuition for most technology-based distance education courses offered by your institution lower than tuition for on-campus courses, about the same, or higher than on-campus course tuition?
(PLEASE CIRCLE ***ONE*** *NUMBER)*

Tuition for most technology-based distance education courses is:

Lower than for on-campus courses............................. 1

About the same as for on-campus courses................. 2

Higher than for on-campus courses............................ 3

35. How much of your institution's current funding for technology-based distance education courses is received from each of the following sources?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR **EACH** ITEM)*

	PERCENT OF FUNDING FOR TECHNOLOGY-BASED DISTANCE EDUCATION RECEIVED FROM LISTED SOURCES:						
	None	Less than 10%	10% to 25%	26% to 50%	51% to 75%	More than 75%	Have No Idea
a. Tuition and fees from students enrolled in technology-based distance education courses	0	1	2	3	4	5	9
b. The institution's general or nondedicated funds	0	1	2	3	4	5	9
c. State and/or local appropriations for distance education	0	1	2	3	4	5	9
d. Other external sources	0	1	2	3	4	5	9

36. How much of an impediment do you think each of the following is to the increased use of technology-based distance education by your institution?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Not An Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
a. Insufficient funds	1	2	3	4	9
b. Lack of top administrators' interest in expanded use of distance education	1	2	3	4	9
c. Lack of faculty interest in teaching distance education courses	1	2	3	4	9
d. Lack of incentives/rewards for faculty to teach distance education courses	1	2	3	4	9
e. Lack of strategic planning	1	2	3	4	9
f. Lack of appropriate organizational structures	1	2	3	4	9
g. Lack of appropriate equipment	1	2	3	4	9
h. Lack of space	1	2	3	4	9
i. Lack of a student "market" for distance education courses	1	2	3	4	9
j. Lack of staff who can provide support for developing/providing distance education courses	1	2	3	4	9
k. State/local policies (for example, state limitations on the number of distance education credits a student can accrue)	1	2	3	4	9

37. In your opinion, how well has your institution accomplished the following?
(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	Not At All	Not Very Well	Moderately Well	Very Well	Have No Idea
a. Developed clear plans for providing technology-based distance education	1	2	3	4	9
b. Met **faculty** needs regarding equipment, technical support, and training to teach technology-based distance education courses	1	2	3	4	9
c. Met **student** needs regarding equipment, technical support, and training to take technology-based distance education courses	1	2	3	4	9
d. Provided incentives and rewards for faculty to teach technology-based distance education courses	1	2	3	4	9
e. Used instructional technologies to improve the overall quality of education at your institution	1	2	3	4	9
f. Used communications technologies (such as e-mail, networking, etc.) to increase the frequency, convenience, and/or quality of **student-faculty** interactions	1	2	3	4	9

Thank you very much for your participation.

Please return this completed questionnaire in the enclosed business-reply envelope to:
SRI International, Survey Research Program, Menlo Park, CA 94025-3493

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901 E Street, NW
Washington, DC 20004-2037
(202) 879-9600

Overview Questionnaire

This study is endorsed by:

- *American Association of Colleges for Teacher Education*
- *American Association of Community and Junior Colleges*
- *American Association for Higher Education*
- *American Association of State Colleges and Universities*
- *Association of American Colleges*
- *CAUSE (Association for Information Technology Managers)*
- *Council of Independent Colleges*
- *Educom*
- *National Association of State Universities and Land-Grant Colleges*
- *National University Continuing Education Association*

Spring, 1994

Dear Colleague:

The Corporation for Public Broadcasting (CPB) is conducting a comprehensive, multi-faceted national survey of 1,000 higher education institutions on the instructional uses of communications technology, including audio, video, multimedia, and computers. (CPB is a private, non-profit corporation created by Congress in 1967 to oversee the growth of public radio and television in the United States.) This study will help us plan for the future of public telecommunications, and it will help educators, policymakers, and funders and producers of educational programming develop better and more effective products.

This questionnaire concerns your institution's use of computers and audio, video, and multimedia technologies for instructional purposes. Either you personally or another representative of your institution has informed us that you are the person most knowledgeable about these issues. ***Your participation is very important to the overall accuracy of the survey results, even if your institution makes little use of computers and other instructional technologies.*** Your responses will be held strictly confidential.

It probably will take about 20 minutes to answer this questionnaire. The attached $5 is a small token of our appreciation for your participation. In addition, we will send you a summary report of the study results, and we will be pleased to work with you or another representative of your institution to provide a customized analysis of the study data.

Please complete this questionnaire as soon as possible and return it in the enclosed business-reply envelope. CPB has engaged SRI International (formerly Stanford Research Institute) to conduct this study. If you have any questions, please contact SRI project director Dr. Susan Russell, at 415/859-4164, or CPB project coordinator Ms. Wendy Charlton, at 202/879-9672.

Thank you in advance for your cooperation.

Sincerely,

Robert T. Coonrod
Executive Vice President

1994 STUDY OF COMMUNICATIONS TECHNOLOGY IN HIGHER EDUCATION

Overview Questionnaire

☛ Questions about faculty refer to **full-time regular faculty**, as defined by your institution.

☛ Questions about students refer to **full-time and part-time students taking courses for credit** at your institution.

AUDIO, VIDEO, AND MULTIMEDIA TECHNOLOGIES

1. Which of the following equipment, if any, is maintained by your institution for faculty or student use? *(PLEASE CIRCLE **ALL THAT APPLY**)*

Tape recorders	1	
Slide projectors	2	
Film projectors	3	
Camcorders	4	
VCRs	5	
Audio compact disc (CD) players	6	
CD ROM players/drivers	7	
Multiscan video projectors (project a videotape or a computer-screen image onto a larger screen)	8	
Other video projectors	9	
LCD projection panels (used with overhead projectors to project a computer-screen image onto a larger screen)	10	
Electronic blackboards	11	
None of the above	0	☛ *Please skip to question 4*

2. When **faculty** request equipment (circled in question 1), how often is it available for their use, for either check-out or on-site use? *(PLEASE CIRCLE **ONE NUMBER**)*

Rarely	Sometimes	Usually	Almost Always	Have No Idea
1	2	3	4	9

3. When **students** request equipment (circled in question 1), how often is it available for their use, for either check-out or on-site use? *(PLEASE CIRCLE **ONE NUMBER**)*

Most Equipment Is Not Available for Student Use	Rarely	Sometimes	Usually	Almost Always	Have No Idea
0	1	2	3	4	9

BEST COPY AVAILABLE

4. **Which of the following, if any, does your institution have available for loan to students or faculty or for student/faculty use on site?**
(PLEASE CIRCLE ALL THAT APPLY IN EACH COLUMN)

	Available for Loan	**Available for Use on Site**
Records, audio tapes, and/or audio CDs	1	1
Videotapes	2	2
Films	3	3
Microfiche or microfilm	4	4
Electronic materials that integrate text and visual images, such as CD ROM-based encyclopedia	5	5
Other CD ROMs (text-only CDs, databases, etc.)	6	6
Other computer software	7	7
Video materials produced by public television (PBS Video, Annenberg/CPB Project telecourses, etc.)	8	8
Audio materials produced by National Public Radio (NPR) or by American Public Radio (APR)	9	9
None of the above	0	0

5. Which of the following, if any have been installed in any of your institution's classrooms?
(PLEASE CIRCLE ALL THAT APPLY)

Video monitor	1
VCR	2
Electronic blackboard	3
Film/slide projection screen	4
Film/slide projection booth	5
Sound amplification system	6
Cable television outlet	7
Closed circuit TV outlet (**not** for cable TV)	8
None of the above	0

6. Does your institution have any of the following?
(PLEASE CIRCLE ALL THAT APPLY)

Audiotape-based learning center/workstations, such as a language lab	1
Videotape-based learning center/workstations	2
Workstations for self-paced individualized multimedia instruction	3
Rooms in which classes can meet as a group that have computers for individual student use (e.g., a computer lab that is sometimes used as a classroom)	4
None of the above	0

7. During the 1993 Fall Term, did your institution offer any **for-credit distance education courses**, at either the undergraduate or graduate level?

☛ By **"distance education,"** we mean the delivery of instruction to students, most of whom are located at a **remote off-campus site or sites (including their homes)**, physically removed from the instructor.

Includes: both one-way and two-way delivery of instruction by any means, including print (e.g., correspondence courses), audio, video, and/or computer technologies.

Does not include: courses in which the only distance education component is an accommodation for students with disabilities; courses in which the instructor travels to a satellite campus or off-campus location to deliver the instruction in-person.

(PLEASE CIRCLE ONE NUMBER)

Yes 1
No 2
No, but we plan to begin offering distance education courses within the next 3 years 3

8. During the 1993 Fall Term, did your institution offer any **on-campus** courses in which the instruction was delivered **primarily through videotape or live video feed**?

☛ *By "on-campus courses," we mean courses that are not exclusively distance education courses.*

(PLEASE CIRCLE ONE NUMBER)

Yes 1
No 2

9. During the 1993 Fall Term, did your institution offer any **on-campus** courses in which the instruction was delivered **primarily through computer-integrated multimedia courseware**?

(PLEASE CIRCLE ONE NUMBER)

Yes 1
No 2

10. Does your institution have any central video reception equipment (e.g., satellite dish, Instructional Television Fixed Service (ITFS) reception equipment, etc.)?

(PLEASE CIRCLE ONE NUMBER)

Yes 1
No 2
Not now but plan to have within the next 3 years 3

11. Does your institution have production or post-production facilities for audio, video, and/or multimedia materials (either self-service or professionally staffed)?

(PLEASE CIRCLE ONE NUMBER)

Yes 1
No 2

12. To your knowledge, are any on-campus classes that are conducted by your faculty audiotaped or videotaped?

(PLEASE CIRCLE ONE NUMBER)

Yes..1
No...2

13. To your knowledge, about what percentage of faculty used each of the following in any of their courses **during the 1993 Fall Term?**

☛ *By "faculty," we mean **full-time regular faculty**, as defined by your institution.*

☛ *Please do **not** include use of these technologies in courses that were offered **only** as distance education courses.*

*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR EACH ITEM)*

	PERCENTAGE OF FACULTY WHO USED EACH LISTED TECHNOLOGY DURING THE 1993 FALL TERM:					
	None	**Fewer than 10%**	**10% to 25%**	**26% to 50%**	**More than 50%**	**Have No Idea**
a. **Computers:** Microcomputers (PCs and Macs), workstations (Suns, NeXTs, etc.), minicomputers, and/or mainframe computers	0	1	2	3	4	9
b. **Audio technologies** (carry sound only): audio cassettes, audiotapes, audio CDs, records, and/or radio	0	1	2	3	4	9
c. **Video technologies** (carry picture and sound): Broadcast, cable, or closed-circuit television; video-cassettes; videodiscs; and/or video projection systems	0	1	2	3	4	9
d. **Multimedia technologies:** Computer-mediated integration of text, audio, and/or video technologies --for example, microcomputers linked to and controlling videodisc players, CD ROMs, video/audio projection units, or slide or video digitizers	0	1	2	3	4	9

COMPUTER TECHNOLOGIES

14. Which of the followings types of computers, if any, does your institution have available to at least some faculty and students for instruction-related purposes (either in or outside the classroom)?
(PLEASE CIRCLE ***ALL THAT APPLY*** *IN EACH COLUMN)*

	INSTITUTION HAS THESE AVAILABLE FOR INSTRUCTION-RELATED PURPOSES:	
	To Faculty	**To Students**
Supercomputers, mainframes, and/or minicomputers	1	1
Microcomputers (PCs, Macs) and/or workstations (Suns, NeXTs, etc.) with **hard-wired connections** to the institution's supercomputer, mainframe, or minicomputer, or to other microcomputers	2	2
Microcomputers (PCs, Macs) and/or workstations (Suns, NeXTs, etc.) with **dialup access** to the institution's supercomputer, mainframe, or minicomputer	3	3
Stand-alone microcomputers (PCs, Macs) and/or workstations (Suns, NeXTs, etc.) **without hard-wired connections or dialup access** to other computers	4	4
None of the above	0	0

15. Does your institution charge either faculty or students for any kind of computer use?
(PLEASE CIRCLE ***ALL THAT APPLY****)*

Yes, we charge faculty................................1
Yes, we charge students..............................2
No.. 3

16. For what percentage of your institution's **faculty** does your institution provide a microcomputer or workstation for their sole use?
(PLEASE CIRCLE YOUR ***BEST ESTIMATE****)*

None	**Fewer than 25%**	**25% to 49%**	**50% to 74%**	**75% to 90%**	**More than 90%**	**Have No Idea**
0	1	2	3	4	5	9

17. What percentage of your institution's **students** have access when needed to a microcomputer or workstation (either their own or one provided by the institution) for use outside the classroom?
(PLEASE CIRCLE YOUR ***BEST ESTIMATE****)*

☛ *Reminder: By "students," we mean* ***full-time and part-time students taking courses for credit*** *at your institution.*

Fewer than 25%	**25% to 49%**	**50% to 74%**	**75% to 90%**	**More than 90%**	**Have No Idea**
1	2	3	4	5	9

18. **What percentage of your institution's faculty and students would you estimate use computers more than once a week** for instructional or research purposes?
(PLEASE CIRCLE YOUR ***BEST ESTIMATE*** *FOR EACH GROUP)*

	Fewer than 25%	**25% to 49%**	**50% to 74%**	**75% to 90%**	**More than 90%**	**Have No Idea**
a. Faculty	1	2	3	4	5	9
b. Students	1	2	3	4	5	9

19. Does your institution have any requirements regarding computer use or familiarity that undergraduate students must meet before graduation?
(PLEASE CIRCLE ***ONE*** *NUMBER)*

Yes, for all undergraduates 1
Yes, for some undergraduates 2
No 3

20. Does your institution require that undergraduate students own (or have sole use of) a personal computer for use in their coursework or study?
(PLEASE CIRCLE ***ONE*** *NUMBER)*

Yes, for all undergraduates 1
Yes, for some undergraduates 2
No 3

21. To your knowledge, in which of the following areas, if any, does your institution offer courses, formal training or informal support/assistance to students, and in which areas is training required of all students?
(PLEASE CIRCLE ***ALL THAT APPLY*** *IN EACH COLUMN)*

	Offered:		
Offered to or Required of Students:	**Courses or Formal Training**	**Informal Support or Assistance**	**Courses or Training Required of ALL Students**
Orientation to the campus computer environment	1	1	1
Use of operating systems (DOS, UNIX, VMS, CMS, etc.) or graphical user interfaces (e.g., Windows)	2	2	2
Use of specific applications software	3	3	3
Use of programming languages (Pascal, C, etc.)	4	4	4
None of the above	0	0	0

22. Does your institution have a campus network that provides for a hard-wired connection among microcomputers throughout your institution? (The network may or may not include a mainframe.)
(PLEASE CIRCLE ***ONE*** *NUMBER)*

Yes 1
No 2
Not now but plan to have within the next 3 years 3

23. Is your institution connected with the Internet or Bitnet?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No 2
Not now but plan to be within the next 3 years 3

24. Does your institution operate or participate with other organizations in operating a community computer network for local (K-12) schools, community organizations, etc.?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No 2
Not now but we plan to develop a community
network within the next 3 years 3

TELEPHONE SYSTEMS/CABLE OUTLETS

25. In about what percentage of each of the following have telephone lines been installed?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE** FOR **EACH** TYPE OF LOCATION)*

	None	1% to 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
a. Faculty offices	0	1	2	3	4	5	9
b. Classrooms and student labs	0	1	2	3	4	5	9

26. Does your institution provide any on-campus dormitories or other on-campus residences for students?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No .... 2 ☛ *Please skip to question 29*

27. What percentage of institutionally owned dormitories/residences have cable television outlets?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

None	1% to 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
0	1	2	3	4	5	9

28. In about what percentage of institutionally owned student dormitory/residence **rooms** have telephone lines been installed?
*(PLEASE CIRCLE YOUR **BEST ESTIMATE**)*

None	1% to 25%	25% to 49%	50% to 74%	75% to 90%	More than 90%	Have No Idea
0	1	2	3	4	5	9

29. **Does your institution have a voice mail system?**
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No.. 2
Not now but plan to have within the next 3 years........ 3

LIBRARY TECHNOLOGIES

30. Does your institution have a library for use by students and faculty?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No.................................... 2 ☛ *Please skip to question 32*

31. Is any of your (main) library catalog in electronic format (e.g., online, CD ROM)?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No.. 2
No, but we expect to begin putting it in
electronic format within the next 3 years.......3

32. Does your institution currently subscribe to any electronic journals (that is, periodicals, serials, etc., provided in electronic format rather than paper copies)?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No.................................... 2
Not sure........................... 9

33. Does your institution have access to any external online or CD-ROM-based bibliographic resources, (DIALOG, ERIC, etc.)?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Yes, online 1
Yes, CD-ROM-based...... 2
No, neither....................... 3
Not sure........................... 9

34. Does your institution have online access to any external full-text resources (e.g., NEXIS)?
☛ *By "full-text" resources, we mean data bases that provide the **full text** of newspaper articles, journal articles, or whatever other information is maintained. (Information typically can be located by key words, topics, author, title, etc.)*
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No.................................... 2
Not sure........................... 9

INSTITUTIONAL PLANS AND POLICIES

35. In your opinion, how much **potential** does each of the following technologies have to help meet your institution's **instructional mission?**
(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	None	Some	A Great Deal	Have No Idea
a. Distance education	1	2	3	9
b. Computer networks	1	2	3	9
c. Classroom uses of audio, video, and multimedia technologies	1	2	3	9

36. In your opinion, how much **potential** does each of the following technologies have to help meet your institution's **community service mission?**
(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

Doesn't apply: This institution has no appreciable community service mission....... 0 ☛ *Please skip to question 37*

	None	Some	A Great Deal	Have No Idea
a. Distance education	1	2	3	9
b. Computer networks	1	2	3	9
c. Classroom uses of audio, video, and multimedia technologies	1	2	3	9

37. **Over the next 3 years,** do you think that each of the following is likely to increase, stay the same, or decrease with regard to **on-campus courses** at your institution?
(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	Increase	Stay the Same	Decrease	Have No Idea
a. Number of faculty who use **audio** technologies for on-campus instructional purposes	1	2	3	9
b. Number of faculty who use **video** technologies for on-campus instructional purposes	1	2	3	9
c. Number of faculty who use **multimedia** technologies for on-campus instructional purposes	1	2	3	9
d. Number of faculty who use **computers** for on-campus instructional purposes	1	2	3	9

38. **Over the next 3 years,** do you think that your institution's expenditures for each of the following are likely to increase, remain the same, or decrease?
(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	Doesn't Apply: Not a Current or Likely Future Area of Expenditures	Increase	Stay the Same	Decrease	Have No Idea
a. Purchase of super-computers, mainframes, and minis	0	1	2	3	9
b. Purchase of microcomputers and workstations	0	1	2	3	9
c. Purchase of software	0	1	2	3	9
d. Network infrastructure	0	1	2	3	9
e. Purchase of audio, video, and multimedia equipment	0	1	2	3	9
f. Subscriptions to electronic journals	0	1	2	3	9
g. Access to online or CD ROM bibliographic resources, such as DIALOG or ERIC	0	1	2	3	9
h. Access to online or CD ROM full-text resources, such as NEXIS	0	1	2	3	9
i. Holdings of videotapes	0	1	2	3	9
j. Holdings of CD ROMs	0	1	2	3	9
k. Training of faculty/students in use of instructional technologies	0	1	2	3	9
l. Instructional technologies technical support	0	1	2	3	9

39. **Over the next 3 years,** do you think that your institution's **funding for instructional technologies** from each of the listed sources is likely to increase, stay the same, or decrease?
(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	Doesn't Apply: Not a Current or Likely Future Source of Funds	Increase	Stay the Same	Decrease	Have No Idea
a. General operating funds of the institution	0	1	2	3	9
b. Internally generated funds (e.g., licensing of institutionally-produced software)	0	1	2	3	9
c. Student/faculty fees for use of computers and other instructional technologies	0	1	2	3	9
d. Special state appropriations	0	1	2	3	9
e. Business, industry, and foundation contracts and grants	0	1	2	3	9
f. Federal contracts and grants	0	1	2	3	9
g. Donations and gifts	0	1	2	3	9

40. In your opinion, to what extent, if at all, have computers and other instructional technologies benefited each of the following?
(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	Doesn't Apply	Not. At All	Not Very Much	A Moderate Amount	A Great Deal	Have No Idea
a. The quality of undergraduate education at your institution	0	1	2	3	4	9
b. The quality of graduate education at your institution	0	1	2	3	4	9
c. The way faculty at your institution teach their classes	xx	1	2	3	4	9
d. Faculty productivity as teachers	xx	1	2	3	4	9
e. Faculty productivity as scholars or researchers	xx	1	2	3	4	9

41. In your opinion, how much of an impediment is each of the following to the increased use of instructional technologies in your institution?
(PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	Not An Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
a. Insufficient funds	1	2	3	4	9
b. Lack of top administrators' interest in expanded use of instructional technologies	1	2	3	4	9
c. Lack of faculty interest in expanded use of instructional technologies	1	2	3	4	9
d. Lack of incentives/rewards to faculty for using instructional technologies	1	2	3	4	9
e. Lack of strategic planning	1	2	3	4	9
f. Lack of appropriate organizational structures	1	2	3	4	9
g. Lack of appropriate instructional software	1	2	3	4	9
h. Lack of appropriate equipment	1	2	3	4	9
i. Lack of space	1	2	3	4	9
j. Lack of infrastructure (e.g., cabling, power outlets)	1	2	3	4	9
k. Faculty technophobia	1	2	3	4	9
l. Student technophobia	1	2	3	4	9
m. Inadequate faculty technical/ computer skills	1	2	3	4	9
n. Inadequate student technical/ computer skills	1	2	3	4	9
o. Lack of staff who can provide training in instructional technologies	1	2	3	4	9
p. Copyright issues	1	2	3	4	9

42. In your opinion, how well has your institution accomplished the following?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Not At All	Not Very Well	Moderately Well	Very Well	Have No Idea
a. Developed clear plans for the use of instructional technology	1	2	3	4	9
b. Met **faculty** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	1	2	3	4	9
c. Met **student** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	1	2	3	4	9
d. Provided incentives and rewards to faculty for integrating instructional technology into the classroom	1	2	3	4	9
e. Used instructional technologies to improve the overall quality of education at your institution	1	2	3	4	9
f. Used communications technologies (such as e-mail, networking, etc.) to increase the frequency, convenience, and/or quality of **student-faculty** interactions	1	2	3	4	9
g. Addressed issues of student access to computers, data bases, and networks	1	2	3	4	9
h. Addressed issues of confidentiality and privacy related to technology use (computers, data bases, and networks)	1	2	3	4	9

Thank you very much for your participation.

Please return this completed questionnaire in the enclosed business-reply envelope to:
SRI International, Survey Research Program, Menlo Park, CA 94025-3493

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901 E Street, NW
Washington, DC 20004-2037
(202) 879-9600

Faculty Questionnaire

This study is endorsed by:

- *American Association of Colleges for Teacher Education*
- *American Association of Community and Junior Colleges*
- *American Association for Higher Education*
- *American Association of State Colleges and Universities*
- *Association of American Colleges*
- *CAUSE (Association for Information Technology Managers)*
- *Council of Independent Colleges*
- *Educom*
- *National Association of State Universities and Land-Grant Colleges*
- *National University Continuing Education Association*

Fall, 1994

Dear Colleague:

The Corporation for Public Broadcasting (CPB) is conducting a comprehensive, multi-faceted national survey of 1,000 higher education institutions on the instructional uses of communications technology, including audio, video, multimedia, and computers. (CPB is a private, non-profit corporation created by Congress in 1967 to oversee the growth of public radio and television in the United States.) This study will help us plan for the future of public telecommunications, and it will help educators, policy makers, and funders and producers of educational programming develop better and more effective products.

This questionnaire concerns your personal use of and opinions about computers and other instructional technologies. Your institution was selected in a random sample of higher education institutions, and your name was selected randomly from a list of full-time regular faculty at your institution. ***Because your name was selected randomly, it is important that you personally participate, even if you rarely or never use computers or other instructional technologies.*** Your responses will be held strictly confidential.

In appreciation for your institution's participation, we will provide your chief academic officer with a summary report of the study results. If you wish, we can also send you a copy. In addition, we will be pleased to work with you or another representative of your institution to provide a customized analysis of the study data.

Please complete this questionnaire as soon as possible and return it in the enclosed business-reply envelope. CPB has engaged SRI International (formerly Stanford Research Institute) to conduct this study. If you have any questions, please contact SRI project director Dr. Susan Russell, at 415/859-4164 (susan_russell@qm.sri.com for e-mail), or CPB project coordinator Ms. Wendy Charlton, at 202/879-9672.

Sincerely,

Robert T. Coonrod
Executive Vice President

P.S. This survey was originally conducted late last spring, but because it reached many faculty as they were leaving for the summer, we are conducting this second mailing. We would very much appreciate your participation.

1994 STUDY OF COMMUNICATIONS TECHNOLOGY IN HIGHER EDUCATION

Faculty Questionnaire

1. To the best of your knowledge, does your institution consider you to be part of its **regular, full-time faculty**?

☛ "Regular, full-time faculty" usually does not include those with "acting", "adjunct," or "visiting" titles.

*(PLEASE CIRCLE **ONE** NUMBER)*

Yes .... 1 ☛ *Please continue*

No .... 2 ☛ *Please stop here and return this questionnaire to SRI in the enclosed business reply envelope*

2. **During the 1993 Fall Term**, did you teach (either by yourself or with other faculty) **any for-credit courses**?

*(PLEASE CIRCLE **ONE** NUMBER)*

Yes .... 1 ☛ *Please continue*

No .... 2 ☛ *Please stop here and return this questionnaire to SRI in the enclosed business reply envelope*

3. **During the 1993 Fall Term**, did you teach (either by yourself or with other faculty) any for-credit **distance education** courses?

☛ By **"distance education,"** we mean the delivery of instruction to students, most of whom are located at a **remote off-campus site or sites (including their homes)**, physically removed from the instructor.

Includes: both one-way and two-way delivery of instruction by any means, including print (e.g., correspondence courses), audio, video, and/or computer technologies.

Does **not** include: courses in which the only distance education component is an accommodation for students with disabilities; courses in which the instructor travels to a satellite campus or off-campus location to deliver the instruction in-person.

*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1

No 2

COMPUTER USE

4. Do you personally **own** one or more computers?

*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1

No .... 2 } *Please skip to question 6*

No, but plan to obtain one in the next 12 months..... 3 }

5. Where is/are the computer(s) that **you personally own** currently located?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Home	1
Office	2
Other location	3
I take it with me (laptop)	4

6. Does your institution provide a microcomputer (PC, Mac) or workstation (Sun, NeXT, etc.) **for your sole use?**
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes	1	☛ *Please skip to question 8*
No	2	
No, but I expect to have one provided for me in the next 12 months	3	

7. Does your institution/department have any open-access microcomputers (PCs, Macs) or workstations (Suns, NeXTs, etc.) that are available for your use?

☛ By **"open-access,"** we mean usually available for general use by students and/or faculty members.

*(PLEASE CIRCLE **ONE** NUMBER)*

Yes	1
No	2
Not sure	9

8. Do you have access to an institutional or departmental minicomputer, mainframe, and/or supercomputer? (You would access one of these larger computers through a computer terminal, microcomputer, or workstation.)
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes	1
No	2
Not sure	9

NETWORKS

9. Do you have a telephone in your office?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes	1	
No	2	} *Please skip to question 11*
Don't have an office	0	

10. Do you have "voice mail" on your phone?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No 2
Not sure 9

11. Do you currently have an e-mail account or access to e-mail (e.g., on a departmental or campus computer network, the Internet, etc.)?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No 2
Not sure 9

12. Does your institution have a campus network that provides for a hard-wired connection among microcomputers/workstations throughout your institution? (The network may or may not include one or more mainframes.)
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No .... 2 } *Please skip to question 14*
Not sure .... 9 }

13. Do you have access to the campus computer network?
*(PLEASE CIRCLE **ONE** NUMBER)*

Yes 1
No 2
Not sure 9

14. Do you have access to the Internet and/or Bitnet?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** NETWORK)*

	Yes	No	Not Sure
a. Internet	1	2	9
b. Bitnet	1	2	9

☛ *If "no" or "not sure" on **both** Internet and Bitnet, please skip to question 16*

15. Which of the following best describes how you access the Internet/Bitnet?
*(PLEASE CIRCLE **ONE** NUMBER)*

My institution provides access 1
I pay a commercial party for access (CompuServe, America Online, etc.) 2
I access the Internet/Bitnet through a community network 3
Other 4
Not sure 9

16. Please indicate below whether each of the following **computer network services** is available to you (on a campus or department computer network, Internet, etc.) and whether you have used each in the past 30 days.
*(FOR **EACH** SERVICE, PLEASE CIRCLE **ONE** NUMBER FOR AVAILABILITY AND **ONE** NUMBER FOR USE)*

	Is This Service Available To You?			**Have You Used This In the Past 30 Days?**		
	Yes	**No**	**Not Sure**	**Yes**	**No**	**Not Sure**
a. E-mail	1	2	9	1	2	9
b. Computer conferencing (using computers to conduct a real time online "conversation" between two or more individuals)	1	2	9	1	2	9
c. File server (provides shared access to software programs or data files for multiple users on a network)	1	2	9	1	2	9
d. Dialup access to the campus network from off campus	1	2	9	1	2	9
e. Ability to log on to computers at other institutions/locations (e.g., via telnet)	1	2	9	1	2	9
f. File Transfer Protocol (FTP) (allows you to transfer files through a network between your computer and another computer)	1	2	9	1	2	9
g. Access to UseNet news groups	1	2	9	1	2	9
h. Access to other online bulletin board(s)	1	2	9	1	2	9

USE OF COMPUTERS FOR RESEARCH OR INSTRUCTION-RELATED PURPOSES

17. Which of the following categories **best** describes how often you used any kind of computer for research or instruction-related purposes **during the 1993 Fall Term**?
*(PLEASE CIRCLE **ONE** NUMBER)*

Never	**Once or Twice**	**Less Than Once a Week**	**About Once a Week**	**More Than Once a Week**	**Daily or More Often**
0	1	2	3	4	5

☛ ***If "never," please skip to question 22 on page 6***

18. For the following kinds of software, please indicate:
   a. Which ones **you** used for research or instruction-related purposes during the 1993 Fall Term.
   b. Which ones **students** in any of your 1993 Fall Term courses **were required** to use to complete one or more assignments.

*(PLEASE CIRCLE **ALL THAT APPLY** IN **EACH** COLUMN)*

	During the 1993 Fall Term: You Used This for Research or Instruction-Related Purposes	During the 1993 Fall Term: Your Students Were Required to Use This to Complete One or More Assignments
Word processing (WordPerfect, Word, etc.)	1	1
Spreadsheets or other business applications (Lotus, Excel, etc.)	2	2
Database packages (dBase, Paradox, etc.)	3	3
Statistical analysis packages (Minitab, SPSS, SAS, Systat, etc.)	4	4
Graphics packages (Harvard Graphics, MacDraw, etc.)	5	5
Desk-top publishing packages (PageMaker, QuarkXPress, FrameMaker, etc.)	6	6
Authoring tools (HyperCard, Toolbook, Linkway, etc.)	7	7
Presentation programs (Powerpoint, Persuasion, etc.)	8	8
Engineering software (e.g., computer-assisted design)	9	9
Instructional software designed to teach specific subject matter	10	10
None of the above	0	0

19. For the following kinds of computer-based activities, please indicate:
   a. Which ones **you** did for research or instruction-related purposes during the 1993 Fall Term.
   b. Which ones **students** in any of your 1993 Fall Term courses **were required** to do to complete one or more assignments.

*(PLEASE CIRCLE **ALL THAT APPLY** IN **EACH** COLUMN)*

	During the 1993 Fall Term: You Did This for Research or Instruction-Related Purposes	During the 1993 Fall Term: Your Students Were Required to Do This to Complete One or More Assignments
Accessed a data base	1	1
Accessed online or CD ROM-based bibliographic resources (e.g., DIALOG, ERIC, online card catalogs, etc.)	2	2
Accessed CD ROM-based full-text resources (e.g., encyclopedias)	3	3
Accessed online full-text resources (e.g., NEXIS)	4	4
Accessed or participated in an online bulletin board	5	5
None of the above	0	0

20. During the 1993 Fall Term, did you have any communications with students or your colleagues (either at your institution or elsewhere) via **e-mail or computer conferencing?**
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** GROUP)*

	Yes	No
a. With students	1	1
b. With colleagues	2	2

21. Were **students** in any of your 1993 Fall Term courses **required** to communicate via **e-mail or computer conferencing** with other students or with you in order to complete one or more assignments?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** GROUP)*

	Yes	No
a. With other students	1	1
b. With you	2	2

INSTRUCTIONAL USES OF COMPUTERS AND OTHER TECHNOLOGIES

22. In the table below, please indicate which of the listed technologies you:

a. Used as an instructional tool in one or more for-credit courses at this institution during the 1993 Fall Term.

b. Have used at any time in the past as an instructional tool in a higher education for-credit course.

c. Plan to use as an instructional tool in a for-credit higher education course within the next 12 months (whether or not you have used the technology to date).

☛ *Please do **not** include use of these technologies in courses that were offered **only** as distance education courses.*

*(PLEASE CIRCLE **ALL THAT APPLY** IN **EACH** COLUMN)*

Used as An Instructional Tool in a For-Credit Course	Used During the 1993 Fall Term	Used At Some Time in the Past	Plan to Use in The Next 12 Months
Audio instructional materials (that is, audio materials created **specifically** for instructional use, such as lectures or other classroom presentations, language tapes, etc.)	1	1	1
Other audio (music, entertainment, news broadcasts, documentaries, etc.)	2	2	2
Video instructional materials (that is, video materials created **specifically** for instructional use, such as lectures, classroom demonstrations, etc.)	3	3	3
Other video (entertainment, documentaries, etc.)	4	4	4
Multimedia materials (computer-mediated integration of text, audio, and/or video) used in classroom presentations	5	5	5
Multimedia materials used for self-paced individualized instruction	6	6	6
None of the above	0	0	0

23. Please indicate below which of the following you have done or plan to do in a for-credit higher education course.
*(PLEASE CIRCLE **ALL THAT APPLY** IN **EACH** COLUMN)*

	Did During the 1993 Fall Term	Did At Some Time in the Past	Plan to Do In The Next 12 Months
Used a computer in the classroom to give a demonstration or presentation	1	1	1
Used a room that has computers for individual student use to teach one or more class sessions	2	2	2
Used a **classroom** that was **specially designed to provide for computer-controlled integration of technologies** such as videodisc players, VCRs, and projection equipment (Do **not** include computer labs, language labs, or other kinds of individual work stations.)	3	3	3
None of the above	0	0	0

24. To the best of your recollection, have you videotaped any public television (e.g., PBS) programs **for use as an instructional tool** in a higher education for-credit course?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** TIME PERIOD)*

	Yes	No
a. Within the past 12 months	1	2
b. Ever	1	2

25. For the time periods indicated, which of the following kinds of materials, if any, have you **developed** (either by yourself or with others) **for use in higher education**?
*(PLEASE CIRCLE **ALL THAT APPLY** IN **EACH** COLUMN)*

	Did Within the Past 12 Months	Did At Some Time In the Past
Audio instructional materials	1	1
Video instructional materials	2	2
Computer software	3	3
Multimedia instructional materials (computer-mediated integration of text, audio and/or video materials)	4	4
None of the above	0	0

TRAINING IN COMPUTERS AND OTHER INSTRUCTIONAL TECHNOLOGIES

26. To the best of your recollection, which of the following types of formal training (e.g., workshops, courses, etc.) have you received in the past 3 years, and which have you received at any time in the past? *(PLEASE CIRCLE **ALL THAT APPLY** IN **EACH** COLUMN)*

	Received In the Past 3 Years	Received At Some Time In The Past
How to use general purpose software, such as word processing, spreadsheets, operating systems, etc.	1	1
Selection of instructional software or courseware	2	2
How to use specific instructional software or courseware in your courses	3	3
How to use audio, video, or multimedia materials in your courses	4	4
Production of audio, video, or multimedia materials	5	5
How to access and use online or CD ROM resources (databases, card catalogs, etc.)	6	6
How to access and use Internet/Bitnet resources	7	7
None of the above	0	0

OPINIONS

27. In your opinion, to what extent, if at all, have computers and other instructional technologies **benefited** each of the following?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Doesn't Apply	Not At All	Not Very Much	A Moderate Amount	A Great Deal	Have No Idea
a. The quality of education that you provide to **undergraduates**	0	1	2	3	4	9
b. The quality of education that you provide to **graduate** students	0	1	2	3	4	9
c. The quality of education **in general** at your institution		1	2	3	4	9
d. The materials you use for your classes		1	2	3	4	9
e. Your productivity as a teacher		1	2	3	4	9
f. Your productivity as a scholar or researcher		1	2	3	4	9
g. Your contacts with colleagues at your institution		1	2	3	4	9
h. Your contacts with colleagues at **other** institutions		1	2	3	4	9
i. Your contacts with your students		1	2	3	4	9
j. Your access to information resources		1	2	3	4	9

28. How much of an impediment is each of the following to **YOUR** increased use of instructional technologies (computers, audio, video, multimedia)?
*(PLEASE CIRCLE **ONE** NUMBER FOR **EACH** ITEM)*

	Not An Impediment	A Minor Impediment	A Moderate Impediment	A Major Impediment	Have No Idea
a. Insufficient institutional/departmental funds	1	2	3	4	9
b. Lack of interest by top administrators at this institution	1	2	3	4	9
c. Lack of interest by my department/ division chairperson	1	2	3	4	9
d. Lack of interest by students	1	2	3	4	9
e. Lack of interest on my part	1	2	3	4	9
f. Amount of time required to learn how to use instructional technologies	1	2	3	4	9
g. Lack of knowledge about how to apply instructional technologies in teaching my courses	1	2	3	4	9
h. Lack of information about the availability of appropriate instructional software for my courses	1	2	3	4	9
i. Lack of appropriate instructional software for my courses	1	2	3	4	9
j. Lack of institutional/departmental incentives/rewards for using instructional technologies	1	2	3	4	9
k. Lack of staff who can provide training in instructional technologies	1	2	3	4	9
l. Lack of appropriate equipment	1	2	3	4	9
m. Lack of infrastructure (cabling, power outlets, etc.)	1	2	3	4	9
n. Lack of space	1	2	3	4	9
o. Student technophobia	1	2	3	4	9
p. Inadequate student technical/ computer skills	1	2	3	4	9
q. Copyright issues	1	2	3	4	9

INSTITUTIONAL ISSUES

29. Which of the following incentives, if any, are usually provided to **faculty in your department** who develop audio, video, computer-based, and/or multimedia instructional materials?
(PLEASE CIRCLE ***ALL THAT APPLY****)*

Doesn't apply: None of the faculty in my department have developed these kinds of instructional materials	0
Faculty share in royalties	1
Faculty retain rights to applications/programs they develop	2
Reduced course load	3
Grants from the department/institution for developing materials	4
Assistance in obtaining grants or contracts for program development	5
Clerical/logistical support	6
Additional compensation from the institution	7
Credit toward promotion/tenure	8
None of the above	9

30. In your opinion, how well has **your institution** accomplished the following?
(PLEASE CIRCLE ***ONE*** *NUMBER FOR* ***EACH*** *ITEM)*

	Not At All	Not Very Well	Moderately Well	Very Well	Have No Idea
a. Developed clear plans for the use of instructional technology	1	2	3	4	9
b. Met **faculty** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	1	2	3	4	9
c. Met **student** needs regarding equipment, technical support, and training for the use of computers and other instructional technologies in the classroom	1	2	3	4	9
d. Provided incentives and rewards to faculty for integrating instructional technology into the classroom	1	2	3	4	9
e. Used instructional technologies to improve the overall quality of education	1	2	3	4	9
f. Used communications technologies (such as e-mail, networking, etc.) to increase the frequency, convenience, and/or quality of **student-faculty** interactions	1	2	3	4	9
g. Addressed issues of confidentiality and privacy related to technology use (computers, data bases, and networks)	1	2	3	4	9

ACADEMIC CHARACTERISTICS

☛ *The following information will help us interpret your responses to the previous questions. All your responses to this questionnaire are **strictly confidential.***

31. What was your tenure status at this institution during the 1993 Fall Term?
*(PLEASE CIRCLE **ONE** NUMBER)*

Doesn't apply No tenure system here	0
Not on tenure track	1
On tenure track but not tenured	2
Tenured	3

32. Which one of the following best describes your academic rank at this institution during the 1993 Fall Term?
*(PLEASE CIRCLE **ONE** NUMBER)*

Doesn't apply: No ranks designated at this institution	0
Distinguished/named professor	1
Professor	2
Associate professor	3
Assistant professor	4
Instructor or lecturer	5
Other	6

33. **During the 1993 Fall Term**, did you hold any of the following positions at this institution?
*(PLEASE CIRCLE **ALL THAT APPLY**)*

Department/division chairperson	1
Dean	2
Assistant or associate dean	3
Provost	4
Assistant, associate, or vice provost	5
No, none of the above	0

DEMOGRAPHIC CHARACTERISTICS

34. What is your gender?
*(PLEASE CIRCLE **ONE** NUMBER)*

Male	1
Female	2

35. What is your age?
*(PLEASE CIRCLE **ONE** NUMBER)*

Under 30	1
30 to 39	2
40 to 49	3
50 to 59	4
60 or older	5

36. Which one of the following **best** describes your race/ethnicity?
*(PLEASE CIRCLE **ONE** NUMBER)*

Asian or Pacific Islander	1
Black/African-American	2
Hispanic/Latino	3
Native American/American Indian or Alaska Native	4
Caucasian/White	5
Other *(please specify below:)*	6

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Thank you very much for your participation.

Please return this completed questionnaire in the enclosed business-reply envelope to:
SRI International, Survey Research Program, Menlo Park, CA 94025-3493